

Sunoco, Inc. 10 Industrial Highway MS4 Lester, PA 19029 610 833 3400

July 22, 2010

Mr. Steve O'Neil Pennsylvania Department of Environmental Protection 2 East Main Street Norristown, PA 19401

Re: Remediation Status Report

Philadelphia Refinery, Second Quarter 2010

Dear Mr. O'Neil:

Enclosed for your review is a quarterly summary letter for the referenced report. Unless otherwise noted, this summary covers work completed between April 1 and June 30, 2010. Detailed information is included in the attached Second Quarter 2010 Remediation Status Report for the Philadelphia Refinery prepared by Stantec Consulting Corporation (Stantec). This letter summarizes the Stantec report details, additional activities under the Consent Order such as investigations of the various AOI's, and planned remediation.

AOI 1 - Belmont Terminal / No. 1 Tank Farm / No. 2 Tank Farm

Consent Order / Characterization Status

- Sunoco submitted to PADEP a Site Characterization Report for AOI 1 dated June 30, 2005. Based on comments received by PADEP with regard to the AOI 1 Site Characterization Report, Sunoco prepared and submitted to PADEP a revised Site Characterization Report for AOI 1 dated July 17, 2006. The recommendations in the AOI 1 report were to supplement the existing remediation system along the northwestern portion of the Belmont Terminal and southeastern portion of the #1 Tank Farm. Sunoco has implemented these actions as detailed in previous quarterly reports. In addition, Sunoco provided PADEP a Remedial Action Plan (RAP) for AOI 1 in January 2008. As a result of the 26th Street North remediation system study and the S-50 Area investigation an addendum to the RAP was necessary.
- In December 2008, a RAP addendum for AOI 1 was submitted to address the 26th Street North recovery system data analysis and the S-50 Area (26th Street South) investigation and subsequent remedial actions. Items surrounding the remedial actions including installation, enhancements and/or performance data for the 26th Street systems will be included in this and future quarterly reports.

Belmont Terminal- Operation During the Quarter

- The loading rack system was operational throughout the quarter.
- The Frontage Road System was brought back on line May 17, 2010.
- Both recovery systems were shut down from May 11 through May 17 for installation of an upgraded discharge line.
- A current system description and recovery totals can be found in section 3.1.1 and Appendix A of the Stantec report.

Belmont Terminal – System Performance

Sunoco currently discharges the recovered total fluids directly into a benzene NESHAP controlled sewer leading to the Point Breeze Area wastewater treatment plant. The Frontage Road system was taken offline on September 11, 2009 due to a blocked discharge line. The line was cleared in April 2010 and the system was brought back on line May 17, 2010.

26th Street Sewer Area - Operation During the Quarter

- The system was operational for the quarter. However, the system was shut down from May 11 through May 17 for the installation of an upgraded discharge line. Currently the recovery wells located within the refinery boundaries and across the street on the CSX property are operational or in a standby mode depending on the presence of LNAPL.
- A current system description and recovery totals can be found in section 3.1.3 and Appendix A of the Stantec report.

26th Street Sewer Area - System Performance

26th Street North:

Sunoco has conducted a performance assessment of this system to better determine the effectiveness of remediation in this area. In general, Sunoco believes that the reporting of groundwater and LNAPL recovery provides limited information on system performance, and should be supplemented with measurements related to maintaining groundwater level and affecting a gradient towards collection points.

The AOI 1 RAP Addendum concluded that the extent of LNAPL has not changed significantly; however LNAPL thickness appears to have decreased over time, indicating stability of LNAPL along the 26th Street North Area.

Historic groundwater concentration data was reviewed to determine if concentration trends exist along the 26th Street boundary of AOI 1. Results indicate that the historic record is not extensive enough to determine reliable trends. An enhanced groundwater monitoring schedule was detailed in the RAP Addendum to determine if a trend can be identified in dissolved groundwater concentrations. The enhanced monitoring program continued this quarter. A summary of the 2nd Quarter 2010 sampling event is provided on Table 2. This effort will continue on a quarterly basis through the Third Quarter 2010. Laboratory results of the data can be found in Appendix D.

26th Street South (S-50 Area):

A comprehensive groundwater investigation was conducted in the 26th Street South area. This data and proposed remedial action was included in the AOI 1 RAP Addendum. To minimize the migration of soluble phase contaminants, a biologically active aerobic barrier utilizing oxygen injection was recommended for the area. A thirty point O₂ injection system was installed to accomplish this barrier. Operational and performance data is collected in accordance with the performance monitoring plan and is included in Appendix B.

Shunk Street Sewer Ventilation System and Biofilter - Operation During the Quarter

On February 17, a fin broke off the blower impeller and the system remains inoperable. Repairs are being evaluated.

- A current system description can be found in section 3.1.2 of the Stantec report.

26th Street Biofilter - Operation During the Quarter

- The biofilter was operational throughout the quarter. On June 18, a drip irrigation system was installed to replace the existing spray irrigation system.
- The system operation is checked once per week and includes the collection of influent and effluent vapor concentrations utilizing a photoionization detector (PID).
- A current system description can be found in section 3.1.4 and Appendix A of the Stantec report.

AOI 2 - Point Breeze Processing Area

Consent Order / Characterization Status

- In October 2006, Sunoco requested that the PADEP accept the re-prioritization of AOI 5 and AOI 2. This re-prioritization of AOIs was accepted by the PADEP in a letter dated October 20, 2006 and the Phase II Corrective Action Activities Schedule (Figure 19 of the CCR) was modified to reflect this change in AOI prioritization. As a result of the re-prioritization, AOI 5 was identified by Sunoco as the fourth area of the Refinery to be investigated in accordance with the Phase II Corrective Action Schedule. A Site Characterization Work Plan for AOI 2 was submitted to PADEP on March 19, 2010. The AOI 2 Site Characterization Report will be submitted to PADEP by September 30, 2010.

Pollock Street Sewer Area – Operation During the Quarter

- Horizontal wells H-1 and H-2 were operational throughout this reporting period with the exception of minor shut downs for maintenance. H-3 was inoperable for most of the quarter due to issues with the air compressor. Repairs have been made and H-3 is currently operational. The outfall skimmer was operational throughout the quarter. A current system description and recovery totals can be found in section 3.2.1 and Appendix A of the Stantec report.
- Vertical wells RW-101, RW-102, RW-103, RW-105 and RW-106 were operational throughout the quarter with the exception of minor shutdowns for maintenance. RW-100 was restarted on June 15.

- The Pollock Street Sewer outfall is checked three times per day and all findings are recorded. This practice will continue and any LNAPL will be handled with spill control equipment to minimize or prevent releases to the Schuylkill River.
- Sunoco has continued to maintain boom and sorbent sweeps around the tide gate area.
- Outfall cleaning, including the changing of sorbents and removal of any fugitive LNAPL from the outfall is performed twice weekly at a minimum.

Short Pier - Operation During the Quarter

- There was no evidence of LNAPL migration to the river during the reporting period.
- Unless evidence of LNAPL migration to the river occurs, the system will remain offline.

AOI 3 - Impoundment Area

<u>RW-2 – Operation During the Quarter</u>

- The system is currently off and will be evaluated during the AOI 3 Site Characterization.
- A site characterization work plan for AOI 3 was submitted to PADEP on March 19 2010. The AOI 3 Site Characterization Report will be submitted to PADEP by September 30, 2010.

AOI 4 - No. 4 Tank Farm Area

Consent Order / Characterization Status

AOI 1 and AOI 4 were identified by Sunoco as the first areas of the Refinery to be investigated in accordance with the Phase II Corrective Action Schedule included in the CCR. Based on characterization performed in 2004, Sunoco recommended a hydraulic control system on the southern border of AOI 4. This system has been designed, a discharge permit from PWD has been finalized, and an air permit from AMS is in the application phase. The installation of this remediation system is planned for the second half of 2010. After Sunoco receives comments from PADEP on the Site Characterization Report, Sunoco will prepare a Cleanup Plan for AOI 4. The Cleanup Plan will include a Remedial Action Plan for this hydraulic control system.

S-30 and S-36 LNAPL Recovery Systems - Operation During the Quarter

- The S-30 LNAPL Recovery System was operational through May 20. The product pump was replaced on June 9 and the system is operational although the water sensor on the pump needs to be replaced.
- The S-36 LNAPL Recovery System was operational during the quarter except for minor maintenance.
- A current system description and recovery totals can be found in section 3.4.1 and Appendix A of the Stantec report.

AOI 5 - Girard Point South Tank Field

Consent Order / Characterization Status

In October 2006, Sunoco requested that the PADEP accept the re-prioritization of AOI 5 and AOI 2. This re-prioritization of AOIs was accepted by the PADEP in its letter correspondence dated October 20, 2006 and the Phase II Corrective Action Activities Schedule (Figure 19 of the CCR) was modified to

reflect this change in AOI prioritization. As a result of the re-prioritization, AOI 5 was identified by Sunoco as the fourth area of the Refinery to be investigated in accordance with the Phase II Corrective Action Schedule. Sunoco prepared and submitted to the PADEP a Site Characterization Work Plan for AOI 5 dated June 15, 2007. Sunoco implemented the Work Plan and a Site Characterization Report for AOI 5 was submitted to PADEP on August 24, 2007.

9 Berth - Operation During the Quarter

- The system is offline due to limited presence of LNAPL.

AOI 6 - Girard Point Chemicals Processing Area

Consent Order / Characterization Status

AOI 6 was identified by Sunoco as the third area of the Refinery to be investigated in accordance with the Phase II Corrective Action Schedule included in the CCR. Sunoco prepared and submitted to the PADEP a Site Characterization Work Plan for AOI 6 dated February 24, 2006. This Work Plan summarized proposed activities to be completed to characterize AOI 6 in accordance with the objectives of the CCR. Sunoco implemented the Work Plan activities between March and October 2006 and prepared and submitted to PADEP a Site Characterization Report for AOI 6 dated September 29, 2006.

27 Pump House - Operation During the Quarter

- The system was started on April 19, 2010 with active recovery from four recovery wells. The system operated throughout the quarter with the exception of minor maintenance.
- A current system description and recovery totals can be found in Section 3.6.1 and Appendix A
 of the Stantec report.

AOI 7 - Girard Point Fuels Processing Area

- There are no groundwater or LNAPL recovery systems in this area.
- A site characterization work plan for AOI 7 was submitted to PADEP in May 2010. The AOI 7 Site Characterization Report will be submitted to PADEP by September 30, 2010.

AOI 8 - Point Breeze North Yard

Consent Order / Characterization Status

Sunoco submitted to the PADEP a Site Characterization Work Plan on May 9, 2008. This Work Plan summarized proposed activities to be completed to characterize AOI 8 in accordance with the objectives of the CCR. Sunoco implemented the Work Plan activities between May and July 2008 and submitted to PADEP a Site Characterization Report for AOI 8 on September 30, 2008. Sunoco has received comments on the report and presented data to PADEP on July 30, 2009.

<u>PGW Border Recovery System - Operation During the Quarter</u>

- The PGW Total Fluids Recovery System was taken offline. The system is being evaluated for possible upgrade.
- A system description can be found in Section 3.8.1 of the Stantec report.

Jackson Street Sewer Area - Operation During the Quarter

- The Jackson Street Sewer Total Fluids Recovery System was taken offline. Due to limited LNAPL presence in the area, the system will remain off unless there are significant increases in LNAPL in the proximal wells.
- The Jackson Street combined sewer overflow outfall ("CSO") is checked once per shift by Sunoco personnel for a sheen or the presence of LNAPL.
- There has been no evidence of sheening throughout the quarter.
- A system description can be found in Section 3.8.2 of the Stantec report.

Jackson Street Sewer Water Curtain - Operation During the Quarter

- The Jackson Street Water Curtain was operational during the quarter.
- During a July 30, 2009 meeting, Sunoco agreed to sample the air in the sewer onsite and offsite following notification from PADEP of a neighborhood (28th and McKean Sts) complaint. Sunoco was not informed of any complaints this quarter.
- Due to reliability issues, the flow meter for the water curtain was taken out of service. Water flow rate is irrelevant to system operation.
- A system description and summary of system data are presented in section 3.8.3 and Appendix C of the Stantec report.

North Yard Bulkhead Area and No. 3 Tank Farm Separator - Operation During the Quarter

- The system was taken offline. Due to limited LNAPL presence in the area, the system will remain off unless there are significant increases in LNAPL in the proximal wells.
- A system description can be found in Section 3.8.4 of the Stantec report.

AOI 9 - Schuylkill River Tank Farm

There are no groundwater or LNAPL recovery systems operational in the area. AOI 9 is currently being investigated in accordance with the Phase II Corrective Action Schedule included in the CCR. Sunoco submitted to the PADEP a Site Characterization Report on October 30, 2009.

AOI 10 - West Yard

There are no groundwater or LNAPL recovery systems operational in the area.

Passyunk Avenue Sewer

The Passyunk Avenue Sewer CSO is checked once per shift at low tide and findings are recorded. LNAPL was not observed at the Schuylkill River outfall during the quarter.

Sunoco will be performing annual gauging in 3rd quarter instead of 2nd quarter. This will allow us to include newly installed wells in AOI's 2, 3, and 7 in the annual gauging event. Please contact me at (610) 833-3444 with any questions or comments.

Best Regards,

Sunoco, Inc. (R&M)

James Oppenheim, PE

Senior Environmental Consultant

Cc:

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File: Remediation Status Report

Philadelphia Refinery, 2nd Quarter 2010

SECOND QUARTER 2010
REMEDIATION STATUS REPORT FOR
THE PHILADELPHIA REFINERY INCLUDING:
BELMONT TERMINAL
POINT BREEZE PROCESSING AREA
GIRARD POINT PROCESSING AREA
SCHUYLKILL RIVER TANK FARM

PREPARED FOR

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July 22, 2010

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FIGURES

Figure 1 Site Location Map

Figure 2 Site Plan - Philadelphia Refinery Main Property

TABLES

Table 1 Quarterly Gauging – May and June 2010

Table 2 AOI 1: 26th Street North Quarterly Groundwater Sampling – May 2010

APPENDICES

Appendix A Groundwater and LNAPL Recovery Volumes for AOI 1, AOI 2, AOI 4, and

AOI 6

Appendix B AOI 1: 26th Street South O₂ System Performance Monitoring Plan

Appendix C AOI 8: Jackson Street Water Curtain

Appendix D AOI 1: 26th Street North Groundwater Sampling Laboratory Analytical Data

Reports (electronic copy)

1.0 INTRODUCTION

Stantec Consulting Corporation (Stantec) has prepared this <u>Second Quarter 2010 Remediation Status Report</u> for Sunoco, Inc. (R&M) (Sunoco) to summarize the remediation and monitoring programs at the Philadelphia Refinery, Schuylkill River Tank Farm, and Belmont Terminal for the period April through June 2010. The Philadelphia Refinery is situated on the banks of the Schuylkill River, approximately 2.3 miles north of its confluence with the Delaware River (**Figure 1** and **Figure 2**). The Belmont Terminal is located in the northeast corner of Area of Interest (AOI) 1. This quarterly report is being submitted to Pennsylvania Department of Environmental Protection (PADEP) as a requirement under the 2003 Consent Order and Agreement (CO&A) between PADEP and Sunoco under paragraph 6 entitled "Quarterly Reports".

Consistent with the December 2003 CO&A, the format of this Status Report was changed, beginning with the 3rd Quarter 2004, so that the Point Breeze Processing Area, Girard Point Processing Area, Schuylkill River Tank Farm, and Belmont Terminal are combined into one Sunoco Philadelphia Refinery Status Report. The report follows the format of the Current Conditions Report (CCR) prepared for the Sunoco Philadelphia Refinery and submitted to PADEP on June 30, 2004. All existing projects and areas are reported according to their associated AOI, which are described in detail in the CCR.

The remediation program consists of dissolved hydrocarbon, light non-aqueous phase liquid (LNAPL), and hydrocarbon vapor recovery. The recovery systems are required by the December 2003 CO&A between Sunoco and the PADEP. The current monitoring program consists of quarterly groundwater and LNAPL gauging of select wells, annual groundwater and LNAPL gauging of all wells, and annual groundwater sampling of select perimeter monitoring wells. During the first, third, and fourth quarters, select wells are gauged to monitor LNAPL thickness and determine hydraulic effects of targeted recovery systems. The site-wide annual well gauging event is conducted during the second quarter with results used to identify the presence of LNAPL and determine groundwater flow patterns. Due to the installation of new wells in AOIs 2, 3, and 7, the annual gauging event for 2010 will be conducted in the third quarter. The purpose of the annual groundwater sampling event which will be conducted in the fourth quarter is to evaluate concentration trends at the perimeter of the refinery. A summary of the second quarter 2010 groundwater gauging data is provided in Table 1.

2.0 GROUNDWATER AND LNAPL RECOVERY SUMMARY

The following section summarizes the groundwater and LNAPL recovery volumes associated with each remediation system.

A cumulative total of 5,873,659 gallons of groundwater and 107 gallons of LNAPL were extracted by the remediation systems during the second quarter of 2010. The total volume (in gallons) of groundwater and LNAPL recovered by each individual system during the reporting period is presented below:

Recovery System Area	Total Ground Water Recovery (gallons)	Total LNAPL Recovery (gallons)
Belmont Terminal (AOI-1)	2,016,213	80
26th Street Sewer Area (AOI-1)	1,625,776	NA
Pollock Street Vertical Wells (AOI-2)	1,964,370	NA
Pollock Street Horizontal Wells (AOI-2)	NA	NA
RW-2 (AOI-3)	0	0
S-30 (AOI-4)	NA	15
S-36 (AOI-4)	NA	12
9 Berth (AOI-5)	0	NA
27 Pump House (AOI-6)	267,300	0
PGW Border Area (AOI-8)	0	
Jackson Street Sewer Area (AOI-8)	0	0
North Yard Bulkhead / No.3 Tank Farm Separator Area (AOI-8)	0	U
Schuylkill River Tank Farm (AOI-9)	0	0
RECOVERY TOTALS:	5,873,659	107

As described in further detail in the following sections, some of the recovery systems pump total fluids (groundwater and LNAPL). For the purpose of calculating the volume of liquids recovered for these systems where LNAPL cannot be quantified separately, the volume of total fluids recovered is reported as groundwater recovered.

Appendix A contains detailed data regarding groundwater and LNAPL recovery volumes for AOI 1, AOI 2, AOI 4, and AOI 6, respectively.

3.0 AREAS OF INTEREST

3.1 AOI 1 – Belmont Terminal / No. 1 Tank Farm / No. 2 Tank Farm

AOI 1 is bordered by Passyunk Avenue to the north, 26th Street to the east, Hartranft Street to the south, and the Process Area 869/employee parking area to the west (**Figure 2**). There are two active remediation systems in this area for groundwater and LNAPL recovery: (1) the Belmont Terminal System and (2) the 26th Street Sewer Area System. There are two associated sewer odor control systems: (1) the Shunk Street Sewer Ventilation System and Biofilter and (2) the Packer Avenue and 26th Street Sewers Ventilation System and Biofilter.

3.1.1 Belmont Terminal Groundwater and LNAPL Recovery System

The Belmont Terminal Groundwater and LNAPL Recovery System is comprised of a network of 13 recovery wells. The recovery wells are located in three areas where LNAPL has the potential to migrate off-site: adjacent to the Shunk Street sewer, along 26th Street, and along Frontage Road. The system consists of dual pumping from the Loading Rack System including wells RW-21, RW-22, RW-23, RW-24, and RW-25 and totals fluids recovery from the Frontage Road System including recovery wells RW-15 and RW-26 through RW-32.

The Loading Rack System consists of five (5) 10-inch diameter recovery wells (RW-21 through RW-25) that operate as dual pumping systems. Each well contains separate pumps controlled by density-driven floats and conductivity probes to pump LNAPL and groundwater respectively. Recovered LNAPL is pumped directly to a 5000-gallon holding tank located next to the system building. The contents of the holding tank are pumped out on an asneeded basis and recycled by the refinery. Recovered groundwater is pumped directly from the wells to a common discharge line (combined with flow from the Frontage Road and 26th Street systems) which discharges directly into a benzene NESHAP controlled sewer. Recovered groundwater is subsequently routed to the Point Breeze Area wastewater treatment plant for further processing.

The Frontage Road System is a total fluids extraction system from eight (8) 4-inch diameter recovery wells (RW-15 and RW-26 through RW-32). The air-driven pumps discharge total fluids to the oil/water separator in the system building. Recovered LNAPL is skimmed from the separator into a 55-gallon drum that utilizes a float system to automatically pump LNAPL to the 5000-gallon holding tank located next to the system building. Recovered groundwater is pumped directly from the wells to an oil/water separator within the system building and then through a common discharge line (combined with flow from the Loading Rack and 26th Street systems) which discharges directly into a benzene NESHAP controlled sewer. Recovered groundwater is subsequently routed to the Point Breeze Area wastewater treatment plant for further processing.

The Belmont Terminal Groundwater and LNAPL Recovery System operational status detail for the reporting period is provided in **Appendix A**.

3.1.2 Shunk Street Sewer Ventilation System and Biofilter

Air and hydrocarbon vapors are recovered from the Shunk Street Sewer at a manhole on the Belmont Terminal. The Shunk Street Sewer Ventilation System and Biofilter consist of a LAU Industries fan. The air and hydrocarbons collected from the sewer are directed into three parallel treatment cells of the biofilter. Prior to entering the treatment cells, the air stream is humidified through the use of water foggers. After passing through the biofilter media, the treated air is discharged to the atmosphere.

The system operation is checked once per week and includes the collection of influent and effluent vapor concentrations utilizing a photoionization detector (PID). The pH of the biofilter leachate is recorded monthly and the pH of the biofilter soil at each of the three beds is recorded quarterly. The blower was damaged by influent particles on February 17, 2010 and repair is being evaluated. The system was not operational for this reporting period.

3.1.3 26th Street Sewer Area Total Fluids Recovery System

The 26th Street Sewer Area Total Fluids Recovery System is comprised of a network of 19 recovery wells along the northeastern border of the refinery, including one well at the Belmont Terminal and five off-site extraction wells as described below. The system was installed to prevent off-site LNAPL migration east of 26th Street and is referred to as "26th Street North Area". The refinery boundary along 26th Street is being evaluated in two sections: 26th Street North Area and the 26th Street South Area.

The 26th Street North Area is comprised of the section of 26th Street from approximately S-89 through RW-400 and north of the former railroad tracks (**Figure 2**). The 26th Street Sewer Area Total Fluids Recovery System includes recovery wells RW-400, S-180, S-181, S-182, S-183, S-184, S-185, S-186, S-187, S-188, S-189, S-190, S-191, and S-192, which are within the refinery confines as well as recovery wells S-194, S-195, S-265, S-266, and S-267, on the CSX property across 26th Street. Each well is equipped with a pneumatic total fluids pump which features an internal liquid level control that allows each pump to discharge independently in accordance with the rate of recharge into the well. Total fluids recovered are pumped directly from the wells through a common discharge line (combined with flow from the Loading Rack and Frontage Road systems) and discharged directly into a benzene NESHAP controlled sewer. Recovered fluids are subsequently routed to the Point Breeze Area wastewater treatment plant for further processing and recovered LNAPL cannot be separately quantified. Operational status detail for the reporting period is provided in **Appendix A**.

The 26th Street South Area is the area south of the former railroad tracks extending from approximately S-42 through S-52 (**Figure 2**). An oxygen injection system was installed in the 26th Street South Area during the first quarter 2009. The system performance monitoring and operational status detail as prepared by Aquaterra Technologies, Inc. is included in **Appendix B**.

3.1.4 Packer Avenue and 26th Street Sewers Ventilation System and Biofilter

Air and hydrocarbon vapors are recovered from the Packer Avenue and 26th Street Sewers at manholes located along 26th Street using a blower. The air and hydrocarbons collected in the sewer air stream are directed into four parallel treatment cells of the biofilter. Prior to entering the treatment cells, the air stream from the blower is combined into a single stream, which is then humidified through the use of steam. After passing through the biofilter media, the treated air is discharged to the atmosphere.

The system operation is checked once per week and includes the collection of influent and effluent vapor concentrations utilizing a photoionization detector (PID). The pH of the biofilter leachate is recorded monthly and the pH of the biofilter soil at each of the four beds has been recorded quarterly. On June 18, 2010 a drip irrigation system was installed to aid in retention of moisture in the treatment cells. At the same time, treatment beds 3 and 4 were shut-down as they are not currently needed for vapor treatment. Therefore, only beds 1 and 2 are currently active and maintained. Operational status detail and monitoring data for the reporting period are presented in **Appendix A**.

3.2 AOI 2 – POINT BREEZE PROCESSING AREA

AOI 2 is bordered by Passyunk Avenue to the north, AOI 1 to the east, Hartranft Street to the south, and the Schuylkill River to the west (**Figure 2**). There is one active remediation system in this area, the Pollock Street Sewer Total Fluids Recovery System.

3.2.1 Pollock Street Sewer Total Fluids Recovery Systems

The Pollock Street Sewer Total Fluids Recovery System consists of total fluids (groundwater and LNAPL) recovery from ten vertical recovery wells (RW-100, RW-101, RW-102, RW-103, RW-104, RW-105, RW-106, RW-110, RW-111, and RW-112) and three horizontal recovery wells (HW-1, HW-2, and HW-3) along Pollock Street. The system was installed to prevent LNAPL from entering into the Schuylkill River via the Pollock Street sewer and backfill. A curtain wall was installed along with the recovery system in order to minimize tidal influence in RW-105 through RW-109.

The original horizontal well (HW-1) was installed in July 2004 along the north side of the Pollock Street Sewer from approximately RW-103 to approximately 100 feet west of RW-101. In 2006, two additional horizontal wells (HW-2 and HW-3) were installed from approximately RW-103 to the intersection of Pollock Street and 16th Street. The totalizers were removed from HW-1, HW-2, and HW-3 because they regularly clogged and prevented flow; therefore, the total fluids recovered from the horizontal wells are no longer quantified. Groundwater and LNAPL from this system discharge directly into a benzene NESHAP controlled sewer and are processed through the Point Breeze Processing Area wastewater treatment plant.

HW-1 and HW-2 were operational throughout the reporting period except for blown diaphragms that were discovered and replaced the week of April 9, 2010. Simultaneously, the flywheel on the compressor for HW-3 was broken and the system was turned off. Repairs to the flywheel and air line were completed the week of May 21st and the system operated until June 11th. HW-3 was off the remainder of the reporting period due to

compressor damage and is pending repairs or replacement. Recovery system operational detail for the vertical wells for the reporting period is provided in **Appendix A**.

The Pollock Street sewer outfall is monitored three times per day and observations are recorded. Sunoco maintains spill control equipment (absorbent booms and sweeps) around the tide gate area to minimize or prevent release of fugitive LNAPL to the Schuylkill River. The presence of LNAPL inside the Pollock Street sewer outfall tide gates was observed throughout the second guarter of 2010.

3.3 AOI 3 – IMPOUNDMENT AREA

AOI 3 is bordered by Hartranft Street to the north, AOI 4 to the east, Penrose Avenue to the south, AOI 6 and AOI 7 to the southwest, and the Schuylkill River to the northwest (**Figure 2**). There is one remediation system in this area, the RW-2 Groundwater and LNAPL Recovery System. The RW-2 Groundwater and LNAPL Recovery System is a dual pumping system.

3.3.1 RW-2 Groundwater and LNAPL Recovery System

The RW-2 Groundwater and LNAPL Recovery System consists of separate electric submersible pumps for groundwater and LNAPL recovery. Both pumps are equipped with density-driven floats that control the respective pumps based on liquid levels in the well. Recovered groundwater is pumped to the Point Breeze Processing Area Wastewater Treatment Plant. Recovered LNAPL is stored in an 8,000-gallon holding tank that is periodically pumped out and the contents recycled by the refinery.

The RW-2 Recovery System was taken temporarily out of service on July 1, 2009 and remains off-line. A system evaluation will be included in the AOI 3 Site Characterization Report due to PADEP by September 30, 2010.

3.4 AOI 4 – No. 4 TANK FARM AREA

AOI 4 is bordered by Hartranft Street to the north, 26th Street to the east, Penrose Avenue to the south, and AOI 3 to the west (**Figure 2**). The S-30 and S-36 LNAPL Recovery Systems are located in this AOI.

3.4.1 S-30 and S-36 LNAPL Recovery Systems

3.4.1.1 S-30 System Description

The S-30 Recovery System is an LNAPL skimming system which uses a Grundfos 5E5 electric, submersible pump controlled by density-driven floats to recover LNAPL from the vicinity of the recovery well. Recovered LNAPL is stored in a holding tank that is pumped out periodically and the contents recycled by the refinery. Operational status details for the S-30 Recovery System are summarized in **Appendix A**.

3.4.2.1 S-36 System Description

The S-36 System consists of pneumatic LNAPL skimming pumps in recovery wells S-34, S-35, and S-36. Recovered LNAPL from each system is stored in a holding tank which is equipped with a pneumatic tank full system that closes the air supply solenoid and bleeds off all residual line pressure when a set high level is reached. The holding tank is pumped out periodically and the contents recycled by the refinery. Operational status details for the S-36 Recovery System are summarized in **Appendix A**.

3.5 AOI 5 – GIRARD POINT SOUTH TANK FIELD AREA

AOI 5 is bordered to the north and northwest by Penrose Avenue and the Penrose Avenue Bridge, an industrial facility to the east, and the Schuylkill River to the south and southwest (**Figure 2**). There is one remediation system in this area, the 9 Berth Total Fluids Recovery System.

3.5.1 9 Berth Total Fluids Recovery System

The 9 Berth Total Fluids Recovery System consists of total fluids (groundwater and LNAPL) recovery from two recovery wells (RWBH-1 and RWBH-2) using electric, submersible pumps. The 9 Berth System was installed to prevent LNAPL from migrating into the Schuylkill River. Total fluids are pumped directly into a sealed benzene NESHAP controlled sewer which discharges to the Girard Point Wastewater Treatment Plant. The 9 Berth Total Fluids Recovery System is no longer operational due to limited presence of LNAPL.

3.6 AOI 6 – GIRARD POINT CHEMICALS PROCESSING AREA

AOI 6 is bordered by Pennypacker Avenue to the north, Lanier Avenue to the east, Penrose Avenue and the Penrose Avenue Bridge to the south, and the Schuylkill River to the west (**Figure 2**). There is one active remediation system in this area, the 27 Pump House Total Fluids Recovery System.

3.6.1 27 Pump House Total Fluids Recovery System

The purpose of the 27 Pump House Total Fluids Recovery System is to recover LNAPL in the vicinity of the recovery wells and prevent migration of LNAPL. Total fluids can be recovered from nine extraction wells (B-124, B-132, B-135, B-136, B-137, B-139, B-142, B-143, and B-147) in the former 27 Pump House area. The total fluids pumps feature a liquid level control inside each pump that discharges independently in accordance with the rate of recharge into each well. Total fluids produced by each of the wells are routed to an oil/water separator where recovered LNAPL is passively skimmed and deposited into two in-line 550-gallon holding tanks. The contents of the holding tanks are pumped out, as necessary, and recycled by the refinery. Groundwater is passed through the separator and pumped to the refinery wastewater treatment plant.

The 27 Pump House Total Fluids Recovery System operational status detail is presented in **Appendix A**.

3.7 AOI 7 – GIRARD POINT FUELS PROCESSING AREA

AOI 7 is bordered by the Schuylkill River to the north and west, by Pennypacker Avenue to the south, and by AOI 3 to the east (**Figure 2**). There is no recovery system located in AOI 7.

3.8 AOI 8 – POINT BREEZE NORTH YARD

AOI 8 is bordered by industrial properties to the north, urban streets to the east, the Philadelphia Gas Works (PGW) property to the south, and the Schuylkill River to the west (**Figure 2**). There are three remediation systems in this area for groundwater and LNAPL recovery: (1) the PGW Border Total Fluids Recovery System, (2) the Jackson Street Sewer Total Fluids Recovery System, and (3) the North Yard Bulkhead / No. 3 Tank Farm Separator Total Fluids Recovery System.

3.8.1 PGW Border Total Fluids Recovery System

The PGW Total Fluids Recovery System is composed of recovery wells RW-200 through RW-205 and an interceptor trench with a recovery sump (RW-206). The system was installed to prevent off-site migration of LNAPL. The total fluids recovery system utilizes electric submersible pumps equipped with individual timers to control each pumping cycle. Total fluids are extracted from wells RW-201, RW-202, and RW-203. Total fluids produced by the 200 series pumps are routed to the North Yard 10,000-gallon holding tank where a flow meter measures incoming fluids produced by the three recovery wells. Groundwater is passed through the tank and routed to the Point Breeze Processing Area Wastewater Treatment Plant. Accumulated LNAPL is pumped out of the 10,000-gallon holding tank as needed by a vacuum truck. All three AOI 8 recovery systems are routed to the 10,000-gallon holding tank; therefore, actual volume of LNAPL recovered from each of the individual recovery systems in AOI 8 cannot be determined.

The PGW Total Fluids Recovery System was taken offline while it is being evaluated to determine if the system warrants modification to enhance LNAPL recovery along the southern border of AOI 8 or if the system can be taken permanently offline.

3.8.2 Jackson Street Sewer Total Fluids Recovery System

The Jackson Street Sewer Total Fluids Recovery System consists of total fluids (groundwater and LNAPL) recovery utilizing electric submersible pumps equipped with individual timers to control the pumping at each recovery well. The system was installed to prevent LNAPL migration to the Jackson Street sewer and the Schuylkill River. The recovery network includes a total of three wells, RW-300, RW-301, and RW-302. Total fluids produced from the wells are routed to the North Yard 10,000-gallon holding tank where a flow meter records the combined total fluids produced from the Jackson Street recovery well network. Groundwater is passed through the tank and routed to the Point Breeze Processing Area Wastewater Treatment Plant. Accumulated LNAPL is pumped out of the 10,000-gallon holding tank as needed by a vacuum truck. All three AOI 8 recovery systems are routed to

the 10,000-gallon holding tank; therefore, actual volume of LNAPL recovered from each of the individual recovery systems in AOI 8 cannot be determined.

The Jackson Street Sewer Total Fluids Recovery System was taken offline due to lack of LNAPL in the vicinity of the system and is being evaluated to determine if the system can be taken permanently offline. The Jackson Street Sewer outfall will continue to be monitored to confirm lack of LNAPL presence.

The Jackson Street combined sewer overflow ("CSO") outfall is monitored for LNAPL sheen and/or the presence of measurable LNAPL once per shift by Sunoco personnel and observations are recorded.

3.8.3 Jackson Street Sewer Water Curtain

In 2003, a water curtain was installed in the Jackson Street sewer area. The water curtain is designed to reduce hydrocarbon odors potentially migrating from the Jackson Street sewer to the surrounding areas. The water curtain apparatus is located in the first manhole west of the interceptor chamber along 26th Street and consists of a single, centrally located nozzle that emits a radial spray pattern of water. Water is supplied to the water curtain apparatus from the North Yard fire water system. Heat trace was installed along the water feed line allowing winter operation of the water curtain.

Water curtain system monitoring includes vapor readings from the interceptor chamber and at the manhole of the water curtain. A summary of system data and operation is presented in **Appendix C**.

3.8.4 North Yard Bulkhead and No. 3 Tank Farm Separator Total Fluids Recovery Systems

The North Yard Bulkhead Total Fluids Recovery System consists of a 3,400-feet long interceptor trench with two recovery sumps (RW-500 and RW-501). The No. 3 Tank Farm Separator Total Fluids Recovery System consists of one recovery system (RW-502) located in the center of the capped, closed separator. These systems are designed to prevent LNAPL from migrating into the Schuylkill River. RW-500, RW-501, and RW-502 utilize electric submersible pumps controlled by a timer to recover total fluids. The total fluids from the three recovery wells are pumped to the North Yard 10,000-gallon holding tank where a flow meter measures incoming fluids produced by the recovery wells. Groundwater is passed through the tank and routed to the Point Breeze Processing Area Wastewater Treatment Plant. Accumulated LNAPL is pumped out of the 10,000-gallon holding tank as needed by a vacuum truck. All three AOI 8 recovery systems are routed to the 10,000-gallon holding tank; therefore, actual volume of LNAPL recovered from each of the individual recovery systems in AOI 8 cannot be determined.

The North Yard Bulkhead and No. 3 Tank Farm Separator Total Fluids Recovery Systems were taken offline due to lack of LNAPL in the vicinity of the system and are being evaluated to determine if the systems can be taken permanently offline.

3.9 AOI 9 - SCHUYLKILL RIVER TANK FARM

AOI 9 is located across the Schuylkill River from AOI 6 and encompasses the entire Schuylkill River Tank Farm (SRTF). AOI 9 is bordered to the north by a junkyard, to the east by the Schuylkill River, to the south by Mingo Creek, and to the west by Essington Avenue. The SRTF Total Fluids Recovery System is no longer operational due to historically low LNAPL recovery from this area.

3.10 AOI 10 - POINT BREEZE PROCESSING AREA - WEST YARD

AOI 10 is located across the Schuylkill River from AOI 2 and encompasses the entire West Yard. AOI 10 is L-shaped with a junkyard located in the crook of the L to the north. AOI 10 is also bordered to the north and west by Passyunk Avenue, to the east by the Schuylkill River, and to the south by a tank farm. There is no groundwater or LNAPL recovery system located in AOI 10.

4.0 MONITORING PROGRAM

4.1 Gauging Event

The current monitoring program consists of quarterly groundwater and LNAPL gauging of select wells, annual groundwater and LNAPL gauging of existing wells, and annual groundwater sampling of select perimeter monitoring wells. During the first, third, and fourth quarters, select wells are gauged to monitor LNAPL thickness and determine hydraulic effects of targeted recovery systems. The site-wide annual well gauging event is conducted during the second quarter of each year with results used to identify the presence of LNAPL and determine groundwater flow patterns. Due to the installation of new wells in AOIs 2, 3, and 7, the annual gauging event for 2010 will be conducted during the third quarter. The purpose of the annual groundwater sampling event which will be conducted in the fourth quarter is to evaluate concentration trends at the perimeter of the refinery.

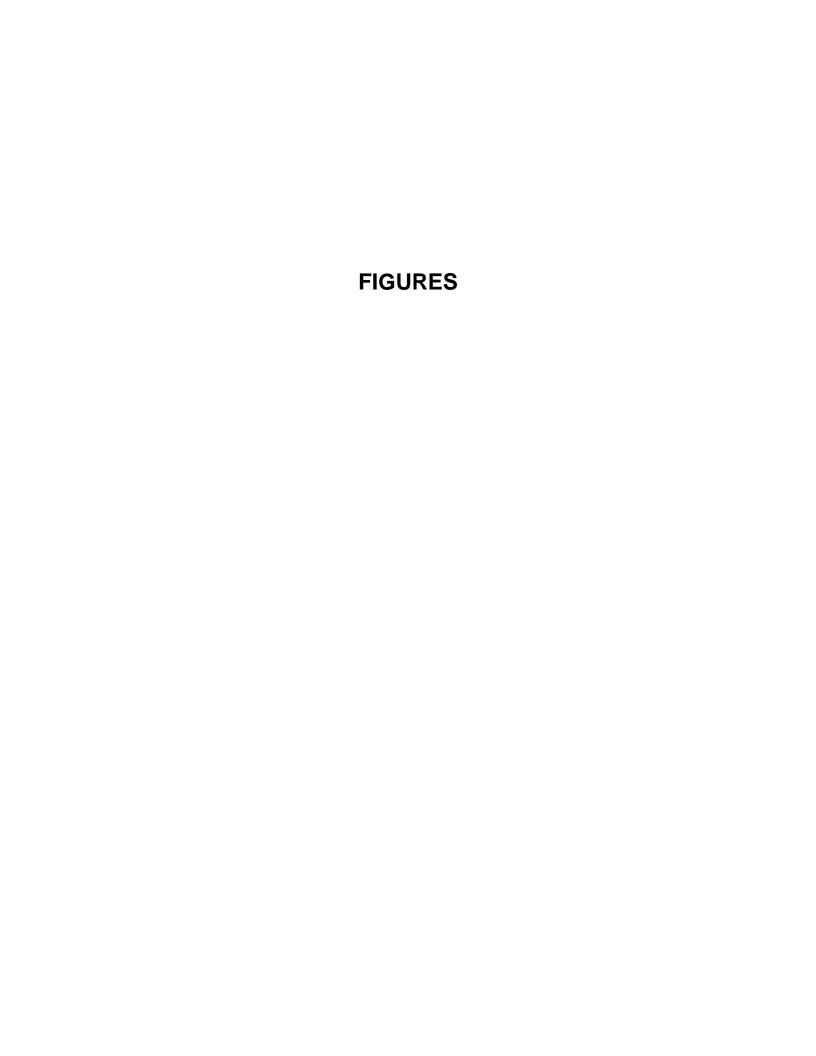
The second quarter 2010 groundwater gauging data were collected throughout the month of May and June. Liquid level measurements collected during the quarterly gauging event are provided in **Table 1**.

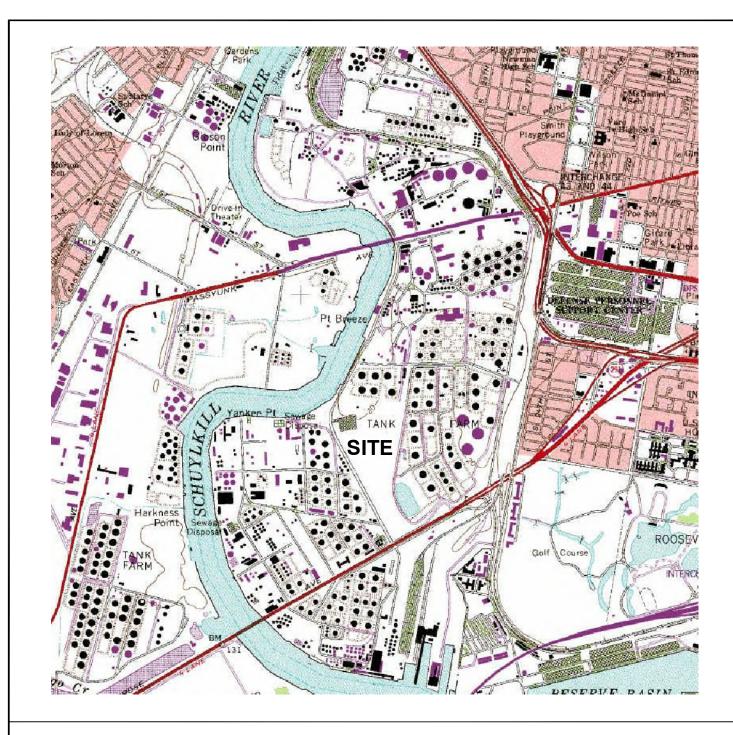
4.2 AOI 1: 26th Street North Quarterly Groundwater Sampling Event

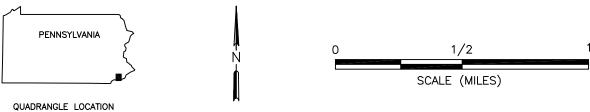
In an effort to support development of a site-specific remediation standard of stability for dissolved hydrocarbon concentrations across the 26th Street North Area, quarterly groundwater gauging and sampling of select observation wells was initiated in the 4th quarter of 2008. The quarterly sampling will continue for a two year period after which the new data set will be analyzed to determine the long-term sampling plan for demonstrating attainment of a site-specific remediation standard.

Prior to groundwater sampling, wells were purged of three well volumes or until dry using a submersible pump at a rate of one gallon per minute or less. Only wells without a measurable thickness of LNAPL were sampled. Each sample was collected with a dedicated disposable bailer upon a minimum of 75% recovery. Field parameters including pH, temperature, specific conductivity, turbidity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) were collected during sampling. The samples were analyzed at a Pennsylvania-certified laboratory for benzene, toluene, ethylbenzene, xylenes, cumene, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, EDC, MTBE, fluorene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(g,h,i)-perylene, phenanthrene, pyrene, chrysene, EDB, and dissolved lead. Dissolved lead samples were field filtered.

A summary of groundwater results for the second quarter of 2010 is provided as **Table 2**. The laboratory analytical data reports are provided in **Appendix D**.







REFERENCE: USGS 7.5 MINUTE QUADRANGLE; PHILADELPHIA, PENNSYLVANIA-NEW JERSEY; 1995

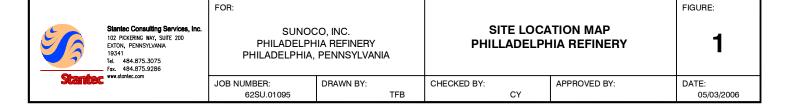






TABLE 1 Sunoco Philadelphia Refinery Second Quarter Gauging Event, May and June 2010

Notes								Apparent	Corrected	
Classification Pumping LNAPL Water Thickness Elevation	AOI	Well ID	Date	Well	Static or	Depth to	Depth to			Notes
AQ11 MW-27 Bri42010 Shallow Commendate State				Classification	Pumping			Thickness	Elevation	
AQ11 MW-28 (0142010) Intermedate Static 24.08 2.407 0.59 5.34 AQ11 MW-30 (0142010) Shallow Static 24.08 2.407 0.59 5.34 AQ11 MW-30 (0142010) Shallow Static 24.08 2.407 0.59 5.34 AQ11 MW-31 (0142010) Shallow Static 24.08 2.407 0.59 5.34 AQ11 MW-32 (0142010) Intermedate Static 24.08 2.407 0.59 6.34 AQ11 MW-32 (0142010) Intermedate Static 24.08 2.407 0.59 6.34 AQ11 MW-32 (0142010) Intermedate Static 24.08 2.407 0.59 6.34 AQ11 MW-36 (0142010) Intermedate Static 24.08 2.407 0.59 6.34 AQ11 MW-36 (0142010) Intermedate Static 24.08 2.407 0.59 6.34 AQ11 MW-38 (0142010) Intermedate Static 24.08 2.407 0.59 6.34 AQ11 MW-38 (0142010) Intermedate Static 24.08 2.40 AQ11 MW-38 (0142010) Intermedate Static 24.08 2.40 AQ11 MW-36 (0142010) Intermedate Static 24.08 2.40 AQ11 MW-36 (0142010) Intermedate Static 24.08 2.30 AQ11 MW-36 (0142010) Intermedate Static 25.08 2.30 AQ11 MW-36 (0142010) Intermedate Static 3.00 AQ11 MW-36 (0142010) Interm										
AO11 MW-30 (F1/42010) Intermediate Static										
ADI MW-30 611/2010 Shallow Static 27.11 4.59										
ADI MW-31 6/14/2010 Shallow Static 25.77 4.79										
A011 MW-36 611/2010 Shallow Static 25.63 4.36		MW-31								
AQ11 MW-35 (611/2010 Intermediate) Static 28.93 3.72 AQ11 MW-37 (611/2010 Intermediate) Static 28.03 4.54 AQ11 MW-37 (611/2010 Intermediate) Static 27.04 4.88 AQ11 MW-38 (611/2010 Intermediate) Static 27.04 4.89 AQ11 MW-39 (611/2010 Intermediate) Static 28.88 4.50 AQ11 MW-39 (611/2010 Intermediate) Static 28.88 4.67 AQ11 MW-31 (611/2010 Intermediate) Static 28.88 4.67 AQ11 MW-31 (611/2010 Intermediate) Static 28.88 4.59 AQ11 MW-31 (611/2010 Intermediate) Static 27.88 AQ11 MW-31 (611/2010 Intermediate) Static 27.88 AQ11 MW-31 (611/2010 Intermediate) Static 27.88 AQ11 MW-31 (611/2010 Intermediate) Static 27.75 AQ11 MW-31 (611/2010 Intermediate) Static 27.97 AQ11 MW-31 (611/2010 Intermediate) Static 27.35 AQ11 MW-31 (611/2010 Intermediate) Pumping AQ11 MW-31 (611/		MW-32								
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AO11 MW-37 6/14/2010 Intermediate Static 27,04 4.88										
AO11 MW-39 61/42/010 Intermediate Static 23.32 4.30										
AO11 MW-49 6*14/2010 Intermediate Static 23.0 23.98 0.38 4.59										
AO1 MW-44 6/14/2010 Intermediate Static 23.11 23.38 0.27 4.46										
AO1 MW-44 6/1/2010 Intermediate Static 26.02 4.59	AOI 1			Intermediate	Static	23.60	23.98	0.38		
AO1 WW-44 6/11/2010 Intermediate Static 25.86 25.86 <0.01 3.45										
AO11 OW-2 61/4/2010 Shallow Static 27.28 4.99										
AOI 0.00-12										
AOJ OW-13 6/14/2010 Shallow Static 27.71 4.49									4.39	No access: lid cannot be opened
AOJ OW-14 674/2010 Shallow Static 27.75 4.46 No access; blocked by vehicle									4.49	ivo access, na carmot be opened
AOI 0W-17		OW-14								
AOI 0.094-18 674/2010 Intermediate Static 27.15 3.69	AOI 1	OW-16				NM	NM	NM		No access; blocked by vehicle
AOI 0W-19		OW-17								
AOI P.Z-401 61/4/2010										
AOI PZ-400										
AOI PZ-401 6/10/2010										
AOI PZ-402 6710/2010										
AOI PZ-403 6/11/2010 NA Static Z5-97 Z6-67 0.70 0.64										
AOI RV-1										Product too viscous to measure
AOI	AOI 1			NA	Static	25.97	26.67		0.64	
AOI RW-75 6/14/2010 Intermediate Static 23.20 5.01 Recovery Well AOI RW-15 6/14/2010 Shallow Pumping 33.40 -4.54 Recovery Well (hung up when gauged) AOI RW-21 6/14/2010 Shallow Pumping 33.40 -4.54 Recovery Well AOI RW-22 6/14/2010 Shallow Pumping 33.30 -5.27 Recovery Well AOI RW-24 6/14/2010 Intermediate Pumping 26.49 26.63 0.14 0.75 Recovery Well AOI RW-24 6/14/2010 Intermediate Pumping 32.55 33.20 0.65 -4.88 Recovery Well AOI RW-25 6/14/2010 Intermediate Static 25.73 26.49 0.76 5.00 Recovery Well RAOI RW-26 6/11/2010 Intermediate Pumping 25.80 4.59 Recovery Well RAOI RW-26 6/11/2010 Intermediate Pumping 25.80 2.85 Recovery Well RAOI RW-28 6/11/2010 Intermediate Pumping 25.80 2.85 Recovery Well RAOI RW-28 6/11/2010 Intermediate Pumping 25.80 2.32 Recovery Well RAOI RW-29 6/11/2010 Intermediate Pumping 25.80 2.32 Recovery Well RAOI RW-30 6/11/2010 Intermediate Pumping 29.10 2.60 Recovery Well RAOI RW-30 6/11/2010 Intermediate Pumping 29.90 2.60 Recovery Well RAOI RW-31 6/11/2010 Shallow Static 16.50 1.22 Recovery Well RAOI RW-410 6/11/2010 Shallow Static 16.50 1.22 Recovery Well RAOI RW-400 6/11/2010 Shallow Static 16.50 1.33 Recovery Well RAOI RW-400 6/10/2010 Intermediate Pumping 24.52 24.52 <-0.01 3.68 Recovery Well RAOI Recovery Well RAOI RW-400 6/10/2010 Intermediate RAOI RW-400 6/10/2010 Intermediate RAOI RAOI RW-400 6/10/2010 Intermediate RAOI RAOI RAOI RAOI RAOI RAOI RW-400 6/10/2010 Intermediate RAOI RA										
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AOI RW-22 6/14/2010 Intermediate Pumping 32.30 -5.27 Recovery Well					_					
AOI RW-24 6/14/2010 Intermediate Pumping 26.49 26.63 0.14 0.75 Recovery Well										
AOI RW-25 6/14/2010 Intermediate Pumping 32.55 33.20 0.65 -4.88 Recovery Well Recovery W								0.14		,
AOI RW-26 6/11/2010 Intermediate Pumping 25.80 2.85 Recovery Well (hung up when gauged)	AOI 1	RW-24	6/14/2010	Intermediate	Pumping	32.55	33.20	0.65	-4.88	Recovery Well
AOI RW-27 6/11/2010 Intermediate Pumping 25.80 2.85 Recovery Well (hung up when gauged)						25.73				
AOI RW-28 6/11/2010 Intermediate Pumping 32.10 -3.32 Recovery Well										,
AOI RW-29 6/11/2010 Intermediate Pumping 29.85 -0.41 Recovery Well										
AOI 1 RW-30 6/11/2010 Intermediate Pumping 29.10 2.60 Recovery Well (hung up when gauged) AOI 1 RW-31 6/11/2010 Intermediate Pumping 29.90 0.66 Recovery Well AOI 1 RW-32 6/11/2010 Intermediate Pumping 33.70 -4.56 Recovery Well AOI 1 RW-110 6/11/2010 Shallow Static 16.34 1.33 Recovery Well AOI 1 RW-111 6/11/2010 Shallow Static 16.30 1.22 Recovery Well AOI 1 RW-401 6/11/2010 Intermediate Pumping 24.52 24.52 <0.01										,
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AOI 1 RW-404 6/11/2010 Intermediate Static 22.12 1.62 Recovery Well AOI 1 RW-405 6/11/2010 Intermediate Static 24.12 24.21 0.09 0.07 Recovery Well AOI 1 RW-406 6/10/2010 Intermediate Static 23.02 23.37 0.35 5.85 Recovery Well AOI 1 S-46 6/11/2010 Intermediate Static 21.23 1.33 AOI 1 S-471 6/11/2010 Intermediate Static 20.87 1.34 AOI 1 S-74 6/14/2010 Shallow Static 25.66 4.43 AOI 1 S-75 6/14/2010 Shallow Static 27.05 0.01 4.20 AOI 1 S-76 6/14/2010 Shallow Static 26.75 27.56 0.81 4.93 AOI 1 S-77P 6/10/2010 Shallow										,
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AOI 1 S-47I 6/11/2010 Intermediate Static 20.87 1.34 AOI 1 S-74 6/14/2010 Shallow Static 25.66 4.43 AOI 1 S-75 6/14/2010 Shallow Static 27.04 27.05 0.01 4.20 AOI 1 S-76 6/14/2010 Shallow Static 26.75 27.56 0.81 4.93 AOI 1 S-77 6/10/2010 Shallow Static 12.33 13.11 0.78 21.72 AOI 1 S-77P 6/10/2010 Shallow Static 28.42 4.62	AOI 1	RW-406				23.02	23.37	0.35	5.85	
AOI 1 S-74 6/14/2010 Shallow Static 25.66 4.43 AOI 1 S-75 6/14/2010 Shallow Static 27.04 27.05 0.01 4.20 AOI 1 S-76 6/14/2010 Shallow Static 26.75 27.56 0.81 4.93 AOI 1 S-77 6/10/2010 Shallow Static 12.33 13.11 0.78 21.72 AOI 1 S-77P 6/10/2010 Shallow Static 28.42 4.62										
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AOI 1 S-76 6/14/2010 Shallow Static 26.75 27.56 0.81 4.93 AOI 1 S-77 6/10/2010 Shallow Static 12.33 13.11 0.78 21.72 AOI 1 S-77P 6/10/2010 Shallow Static 28.42 4.62										
AOI 1 S-77 6/10/2010 Shallow Static 12.33 13.11 0.78 21.72 AOI 1 S-77P 6/10/2010 Shallow Static 28.42 4.62										
AOI 1 S-77P 6/10/2010 Shallow Static 28.42 4.62										

TABLE 1 Sunoco Philadelphia Refinery Second Quarter Gauging Event, May and June 2010

							Apparent	Corrected	
AOI	Well ID	Date	Well	Static or	Depth to	Depth to	LNAPL	Groundwater	Notes
		20	Classification	Pumping	LNAPL	Water	Thickness	Elevation	
AOI 1	S-79	6/10/2010	Intermediate	Static	23.53	23.93	0.40	7.78	
AOI 1	S-79P	6/10/2010	Shallow	Static		26.01		4.41	
AOI 1	S-80	6/10/2010	Shallow	Static		27.81		4.32	
AOI 1	S-81	5/5/2010	Shallow	Static	21.23	21.29	0.06	6.67	
AOI 1	S-82	6/10/2010	Shallow	Static	23.45	23.76	0.31	4.09	
AOI 1	S-83	6/10/2010 6/11/2010	Shallow Intermediate	Static	19.12	19.84	0.72	4.78	Wall was dry
AOI 1	S-84 S-85	5/5/2010	Shallow	Static Static		9.20 22.94		13.79 2.19	Well was dry
AOI 1	S-86	5/5/2010	Intermediate	Static	25.82	25.82	<0.01	1.24	
AOI 1	S-87I	6/11/2010	Intermediate	Static		24.53		1.34	
AOI 1	S-88	5/5/2010	Intermediate	Static		24.60		-0.50	
AOI 1	S-88A	6/11/2010	Shallow	Static		25.27		0.45	
AOI 1	S-89	5/5/2010	Intermediate	Static	25.85	25.85	<0.01	0.15	
AOI 1	S-98	6/11/2010	Intermediate	Static	23.23	23.24	0.01	5.58	
AOI 1	S-99	5/6/2010	Intermediate	Static		24.21		1.19	
AOI 1	S-100	5/6/2010	Shallow	Static	22.40	22.95	0.55	5.03	
AOI 1	S-101	5/6/2010	Intermediate	Static		46.13		2.99	
AOI 1	S-116	6/11/2010 5/5/2010	Shallow Shallow	Static	21.06	13.10	1 1 1	13.26	
AOI 1 AOI 1	S-125 S-126	6/11/2010	Shallow	Static Static	21.86 14.90	23.00 15.51	1.14 0.61	5.03 14.10	
AOI 1	S-120	6/11/2010	Shallow	Static	16.81	16.83	0.01	1.26	
AOI 1	S-164	6/11/2010	Shallow	Static		15.22		1.48	
AOI 1	S-179	6/10/2010	Intermediate	Static		18.98		5.59	
AOI 1	S-180	6/10/2010	Intermediate	Static		18.95		5.87	Recovery Well (hung up when gauged)
AOI 1	S-181	6/10/2010	Intermediate	Pumping		24.70		1.61	Recovery Well
AOI 1	S-182	6/10/2010	Intermediate	Pumping		25.00		1.42	Recovery Well
AOI 1	S-183	6/10/2010	Intermediate	Pumping		25.20		1.58	Recovery Well
AOI 1	S-184	6/10/2010	Intermediate	Pumping		25.10		1.22	Recovery Well
AOI 1	S-185	6/10/2010	Intermediate	Pumping		27.50		-0.04	Recovery Well
AOI 1	S-186	6/10/2010 6/10/2010	Intermediate	Pumping	24.04	23.85	0.06	3.31	Recovery Well (continuous)
AOI 1 AOI 1	S-187 S-188	6/10/2010	Intermediate Intermediate	Static Pumping	24.01	24.07 27.70	0.06	4.10 0.58	Recovery Well (hung up when gauged) Recovery Well
AOI 1	S-189	6/10/2010	Intermediate	Pumping		26.00		3.63	Recovery Well
AOI 1	S-190	6/10/2010	Intermediate	Pumping	26.28	26.45	0.17	3.49	Recovery Well (continuous)
AOI 1	S-191	6/10/2010	Intermediate	Pumping		27.66		1.47	Recovery Well (continuous)
AOI 1	S-192	6/10/2010	Intermediate	Pumping		25.77		3.56	Recovery Well (continuous)
AOI 1	S-193	5/6/2010	Intermediate	Static		23.45		4.65	
AOI 1	S-194	6/11/2010	Shallow	Static		16.10		14.94	Recovery Well
AOI 1	S-195	6/11/2010	Shallow	Static		25.07		4.98	Recovery Well
AOI 1	S-196	5/6/2010	Shallow	Static		45.03		5.02	
AOI 1	S-198	6/10/2010	Intermediate	Static	25.35	26.92	1.57	5.64	
AOI 1	S-199 S-200	6/10/2010 6/10/2010	Intermediate Intermediate	Static Static	25.30	26.26 24.86	0.96	5.29 4.20	
AOI 1	S-200	6/10/2010	Intermediate	Static	23.71	24.58	0.87	4.92	
AOI 1	S-201	6/10/2010	Intermediate	Static	20.71	28.35		5.88	Casing broken off just below grade
AOI 1	S-203	6/10/2010	Intermediate	Static	27.32	28.28	0.96	5.51	Casing Stoken on Just Solow grads
AOI 1	S-205	6/11/2010	Intermediate	Static	18.30	20.18	1.88	11.47	
AOI 1	S-206	6/10/2010	Intermediate	Static		27.13		4.65	
AOI 1	S-207	6/10/2010	Intermediate	Static		12.57		14.63	
AOI 1	S-211	6/11/2010	Intermediate	Static		13.65		1.60	
AOI 1	S-212	6/11/2010	Intermediate	Static		17.09		1.28	
AOI 1	S-213	6/11/2010	Intermediate	Static		13.72		1.49	
AOI 1	S-261	6/11/2010	Intermediate	Static		23.59		3.82	
AOI 1	S-265	6/11/2010	Intermediate	Static	15.04	15.04	<0.01	15.71	Recovery Well
AOI 1	S-266	6/11/2010	Intermediate	Static		13.60		18.45	Recovery Well
AOI 1	S-267	6/11/2010	Intermediate	Static		15.58		17.58	Recovery Well
AOI 1	S-268	6/11/2010	Intermediate	Static		26.95		4.50	
AOI 1	S-271	5/6/2010	Intermediate	Static		24.08		4.40	
AOI 1	S-272	5/6/2010	Intermediate	Static		23.95		4.41	
AOI 1	S-274	5/6/2010	Intermediate	Static		23.31		4.44	
AOI 1	S-274 S-275	5/6/2010 5/6/2010	Intermediate Intermediate	Static Static		23.10		4.27 4.35	
AOI 1	S-275	5/6/2010	Intermediate	Static	22.38	23.13	0.75	4.80	
AOI 1	S-277	5/6/2010	Intermediate	Static	21.35	23.13	2.53	4.35	
	· ·	3, 3, 2 3 10	onnodiate	Julio		_0.00	2.00	1.00	l .

TABLE 1 Sunoco Philadelphia Refinery Second Quarter Gauging Event, May and June 2010

							Annaront	Corrected	
AOI	Well ID	Date	Well	Static or	Depth to	Denth to	Apparent LNAPL	Groundwater	Notes
7.01	1101112	Date	Classification	Pumping	LNAPL	Water	Thickness	Elevation	Notes
AOI 1	TW-3	6/14/2010	Shallow	Static		26.72		5.39	
AOI 1	TW-5	6/14/2010	Shallow	Static		27.30		4.77	
AOI 1	TW-8	6/14/2010	Shallow	Static		25.84		4.30	
AOI 1	TW-9	6/14/2010	Shallow	Static		27.40		4.70	
AOI 1	TW-10	6/14/2010	Shallow	Static	26.22	26.22	<0.01	4.01	
AOI 1	TW-11	6/14/2010	Shallow	Static		27.98		4.42	
AOI 3	RW-2	6/3/2010	Intermediate	Static	10.79	10.96	0.17	0.64	Recovery Well
AOI 4	S-27	6/3/2010	Intermediate	Static		22.90		1.93	
AOI 4	S-28	6/3/2010	Shallow	Static	20.73	20.73	<0.01	5.01	
AOI 4	S-29	6/3/2010	Intermediate	Static	19.65	23.95	4.30	7.33	
AOI 4	S-30	6/3/2010	NA	Static	21.00	22.79	1.79	3.66	Recovery Well
AOI 4	S-31	6/3/2010	Shallow	Static		18.30		6.30	
AOI 4	S-32	6/3/2010	Shallow	Static		22.23		1.97	
AOI 4	S-34	6/3/2010	Shallow	Static		19.55		3.75	Recovery Well
AOI 4	S-35	6/3/2010	Shallow	Pumping	19.55	19.55	<0.01	5.15	Recovery Well
AOI 4	S-36	6/3/2010	Shallow	Pumping	22.67	22.76	0.09	1.64	Recovery Well
AOI 4	S-57	6/3/2010	Shallow	Static		10.98		1.52	
AOI 4	S-97	6/3/2010	Shallow	Static		27.65		2.66	
AOI 4	S-123	6/3/2010	Intermediate	Static		20.21		1.92	
AOI 4	S-218	6/3/2010	Intermediate	Static		23.59		2.15	
AOI 4	S-219	6/3/2010	Intermediate	Static	40.70	21.06		2.03	
AOL 5	S-220	6/3/2010	Intermediate	Static	18.79	19.01	0.22	2.21	Decesion: Well
AOI 5	RWBH-1 RWBH-2	6/10/2010 6/10/2010	NA NA	Static	2.00	3.29	0.01	2.04	Recovery Well Recovery Well
AOI 5	B-124	6/10/2010	Shallow	Static Pumping	3.99	4.00 6.30	0.01	0.15 2.67	Recovery Well
AOI 6	B-132	6/10/2010	Shallow	Static	4.78	4.79	0.01	2.10	Recovery Well
AOI 6	B-135	6/10/2010	Shallow	Static	4.60	4.79	0.07	1.84	Recovery Well
AOI 6	B-136	6/10/2010	Shallow	Static	4.35	4.42	0.07	4.86	Recovery Well
AOI 6	B-137	6/10/2010	Shallow	Static	4.05	4.59	0.54	5.15	Recovery Well
AOI 6	B-139	6/10/2010	Shallow	Pumping		8.50		0.90	Recovery Well
AOI 6	B-142	6/10/2010	Shallow	Pumping		10.65		-0.91	Recovery Well
AOI 6	B-143	6/10/2010	Shallow	Pumping		10.10		-1.12	Recovery Well
AOI 6	B-147	6/10/2010	Shallow	Static	6.47	6.58	0.11	2.53	Recovery Well
AOI 8	RW-200	6/3/2010	Intermediate	Static		5.53		6.49	Recovery Well
AOI 8	RW-201	6/3/2010	Intermediate	Static	22.12	22.25	0.13	9.98	Recovery Well
AOI 8	RW-202	6/10/2010	Intermediate	Static		19.73		9.78	Recovery Well
AOI 8	RW-203	6/10/2010	Intermediate	Static	21.77	21.91	0.14	9.46	Recovery Well
8 IOA	RW-204	6/10/2010	Intermediate	Static	18.57	19.61	1.04	10.94	Recovery Well
8 IOA	RW-205	6/10/2010	Intermediate	Static	18.26	22.43	4.17	15.21	Recovery Well
AOI 8	RW-206	6/10/2010	Intermediate	Static	20.49	20.50	0.01	10.45	Recovery Well
8 IOA	RW-300	6/10/2010	Intermediate	Static	14.64	15.11	0.47	7.39	Recovery Well
AOI 8	RW-301	6/10/2010	Intermediate	Static		11.47		10.94	Recovery Well
AOI 8	RW-302	6/10/2010	Intermediate	Static		12.62		11.47	Recovery Well
AOI 8			Intermediate	Static		13.25			Recovery Well
AOI 8	RW-304	6/3/2010	Intermediate	Static		14.09		11.19	Recovery Well
AOI 8	RW-305	6/3/2010	Intermediate	Static	14.35	14.35	<0.01	10.92	Recovery Well
AOI 8	RW-306	6/3/2010	Intermediate	Static	12.50	12.50	<0.01	11.09	Recovery Well
AOI 8	RW-307	6/3/2010	Intermediate	Static		14.45		8.81	Recovery Well
AOI 8	RW-308	6/3/2010	Intermediate	Static		16.40		9.21	Recovery Well
AOI 8	RW-309	6/3/2010	Intermediate	Static		15.29		9.94	Recovery Well
AOI 8	RW-500	6/3/2010	Intermediate	Static	 F 00	2.38		5.18	Recovery Well
AOI 8	RW-501 RW-502	6/3/2010 6/3/2010	Intermediate Intermediate	Static Static	5.09 8.95	5.09 9.15	<0.01 0.20	4.70 3.70	Recovery Well Recovery Well
7010	11117302	0/3/2010	interineulate	Glatic	0.33	9.10	0.20	5.70	INCOUVERY VV GII

Notes:

All measurements are in feet.

LNAPL = light non-aqueous phase liquid
---- = LNAPL not present
Specific gravity of LNAPL in the well or a nearby well was used for determining corrected groundwater elevation.
When product thickness was measured at <0.01, corrected groundwater elevation was calculated using 0.01 feet.

Table 2 Sunoco, Inc. Philadelphia Refinery AOI-1: 26th Street North Groundwater Analytical Results Summary

Well Number	Date Collected	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Total BTEX	Methyl Tertiary Butyl Ether (MTBE) (ug/l)	Isopropylbenzene (Cumene) (ug/I)	Naphthalene (ug/l)	1,2,4- Trimethylbenzene (1,2,4-TMB)	1,3,5- Trimethylbenzene (1,3,5-TMB)	1,2-Dichloroethane (EDC) (ug/l)	1,2-Dibromoethane (EDB) (ug/l)	Chrysene (ug/l)	Fluorene (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)	Anthracene (ug/I)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b) fluoranthene (ug/l)	Benzo(g, h.i)perlene (ug/l)	Dissolved Lead (mg/l)
	11/05/08	NS	NS	NS	NS	NS	NS	NS NS	NS NS	NS	NS	NS	NS	NS	NS NS	NS	NS	NS	NS	NS	NS	NS	NS
	02/24/09 06/30/09	NS 200	NS 18	NS 97	NS 120	NS 435	NS 5	NS 70	NS 54	NS 67	NS 72	NS ND (0.5)	NS ND (0.0098)	NS NA	NS NA	NS NA	NS NA	NS NA	NS NA	NS NA	NS NA	NS NA	NS 0.0038
S-81	09/08/09	140	16	110	140	406	3	76	75	88	92	ND (0.5)	ND (0.0098)	ND (1)	5 J	6	3 J	1 J	ND (1)	ND (1)	ND (1)	ND (1)	0.0039
	11/20/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	03/09/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	05/05/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/05/08	10	3	160	230	403	67	97	120	100	170	ND (1)	ND (0.0099)	11 ND (5.5)	NA 16	66	30 ND (37)	17	10	8	8	7	0.0218
	02/24/09 06/26/09	12 13	3 4	170 92	220 29	405 138	62 62	120 130	160 97	110 26	160 160	ND (0.5) ND (0.5)	ND (0.0097) ND (0.010)	ND (5.5) 0.93 J	16 17	29 25	ND (27) 6.2	7.1 6.1	3.2 1.6	2.8 1.4	2.6 1.5	ND (3.5) 2.6	0.0044 0.0043
S-85	09/09/09	11	3	220	310	544	53	140	180	190	290	ND (0.5)	ND (0.0098)	ND (9)	20 J	39 J	23 J	ND (9)	ND (9)	ND (9)	ND (9)	ND (9)	0.0042
	11/20/09	8	ND (3)	99	150	257	36	110	150	170	180	ND (3)	ND (0.0099)	5.9	27	46	17	13	4.6	4.0	3.8	3.9	0.0036
	03/08/10	7	1	53	230	291	12	62	90	110	130	ND (0.5)	ND (0.0098)	13	23	41	40	12	8.8	8.1	9.1	8.7	0.0062
ĺ	05/05/10	10	2	46	240	298	22	96	120	130	150	ND (0.5)	ND (0.017)	7.3	22	36	17	9.1	4.5	5.0	4.5	4.6	0.0042
																		_					
ĺ	11/05/08 02/24/09	450 65	20	11	410 930	891 1,036	35 61	33 88	ND (5) ND (10)	170 600	57 180	ND (3) ND (5)	ND (0.0097) ND (0.0097)	22 ND (71)	NA 31	19 41	30 ND (49)	7 15	8 ND (7.0)	19 13	ND (1) 25	12 ND (45)	0.00096 J 0.00097 J
	06/26/09	50	19	7	210	286	77	68	ND (10)	100	33	ND (0.5)	ND (0.0097)	ND (71) ND (6.0)	13	15	9.7	4.8	ND (7.0) ND (1.7)	4.7	5.2	15	0.00097 3
S-86	09/08/09	150	27	12	290	479	58	54	5 J	130	45	ND (1)	ND (0.0099)	1 J	4 J	3 J	2 J	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	0.0011
	11/20/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	03/08/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	05/06/10	92	24	14	390	520	31	40	9 J	200	66	ND (3)	ND (0.018)	120	47	61	75	36	30	42	72	93	0.00062 J
	11/07/00					40	70		ND (4)	ND (0.5)	0.5.1	ND (0.5)	ND (0.0007)				_		0.1				0.0004
	11/07/08 02/24/09	29 30	8	4	3 27	42 42	70 69	29 27	ND (1) ND (1)	ND (0.5) 13	0.5 J 9	ND (0.5) ND (0.5)	ND (0.0097) ND (0.0096)	6 ND (9)	NA 5.3	11	7 ND (16)	3 J 3.7	3 J 2.3	2 J 2.2	3 J 3.4	2 J ND (6.0)	0.0031 0.0021
	06/26/09	29	11	4	6	50	92	48	ND (1)	0.8 J	1 J	ND (0.5)	ND (0.010)	0.40	4.4	5.1	ND (0.90)	1.2	0.25	0.20	0.20	0.40	0.0021
S-88	09/08/09	35	24	6	28	93	77	42	7	7	7	ND (0.5)	ND (0.0099)	ND (1)	3 J	3 J	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	0.0018
	11/20/09	12	4	3	3	22	47	16	ND (2)	2 J	2 J	ND (1)	ND (0.0097)	1.8 J	3.1 J	3.2	1.6 J	0.98 J	0.45	0.89	1.3	1.9 J	0.0015
	03/08/10	17	8	2	4	31	100	29	ND (1)	0.5 J	1 J	ND (0.5)	ND (0.0097)	2.5	2.7 J	2.4	1.8 J	0.70 J	0.54	0.83	1.7	ND (2.3)	0.0179
	05/05/10	8	3	ND (1)	1 J	12	170	15	ND (2)	ND (1)	ND (1)	ND (1)	ND (0.018)	360	160	240	350	83	90	160	250	330	2.06
	11/07/00	16	2	2	20	40	42	57	4.1	9	0	ND (0.5)	ND (0.0098)	2 J	NA	F	3 J	2 J	ND (4)	ND (4)	ND (4)	ND (4)	0.0035
	11/07/08 02/24/09	16 11	3	9	20 87	110	43 41	59	4 J 22	86	8 60	ND (0.5)	ND (0.0098) ND (0.0097)	ND (14)	32	5 60	ND (85)	18	ND (1) ND (5.0)	ND (1) 3.3	ND (1) 3.9	ND (1) ND (6.5)	0.0033
ĺ	06/30/09	34	ND (3)	9	40	83	38	60	31	94	65	ND (3)	ND (0.0098)	NA NA	NA	NA NA	NA NA	NA NA	NA NA	NA	NA	NA	0.0014
S-89	09/09/09	19	2	10	87	118	39	93	20	86	54	ND (0.5)	ND (0.0099)	ND (0.9)	16	22	8	ND (0.9)	2 J	1 J	2 J	ND (0.9)	0.0028
ĺ	11/20/09	24	ND (3)	9	37	70	34	83	12 J	45	27	ND (3)	ND (0.0098)	10	34	59	ND (69)	ND (18)	3.3	2.5	2.7	2.4	0.0019
ĺ	03/09/10	210	2 J	40	200	452	29	37	60	220	150	ND (1)	ND (0.0097)	120	330	620	ND (950)	ND (180)	42	27	40	ND (23)	0.0019
	05/06/10	100	ND (3)	37	150	287	38	55	53	230	140	ND (3)	ND (0.018)	160	210	190	750	160	60	52	54	49	0.0015
	11/06/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
ĺ	02/23/09	2,000	78	1,400	7,800	11,278	10	140	800	2,300	1,100	ND (5)	ND (0.0099)	ND (11)	59	91	ND (110)	22	ND (4.5)	2.3	2	2.8 J	0.0049
ĺ	06/30/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
S-98	09/09/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
ĺ	11/20/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
ĺ	03/09/10	NA 170	NA 7 I	NA 110	NA 480	NA 767	NA 42	NA 27	NA 68	NA 480	NA 150	NA ND (5)	NA ND (0.018)	NA 1.6	NA 3.4	NA 6.6	NA ND (9.9)	NA ND (2.0)	NA 0.42	NA 0.28	NA 0.22	NA 0.41	NA 0.0035
	05/06/10	170	7 J	110	400	101	442	21	00	4 0U	130	ND (5)	ND (0.010)	1.6	3.4	6.6	ND (9.9)	ND (2.0)	0.42	0.20	0.22	0.41	0.0035
			i	i	i												1					İ	
ĺ	11/06/08	46	14	ND (3)	14	74	36	30	ND (5)	ND (3)	ND (3)	ND (3)	ND (0.0098)	ND (1)	NA	4 J	1 J	NA	NA	NA	NA	NA	0.0016
ĺ	02/23/09	55	20	4	20	99	19	65	ND (1)	ND (0.5)	1 J	ND (0.5)	ND (0.0097)	ND (0.15)	5.4	3.7	ND (0.095)	0.69	0.062	0.072	0.076	ND (0.15)	0.0012
S-99	06/29/09	34	31	7	31	103	25	99	ND (1)	ND (0.5)	2 J	ND (0.5)	ND (0.017)	NA	NA	NA	NA NA	NA	NA	NA NA	NA NA	NA	0.0014
	09/09/09	24	22	5	26	77	19	87	ND (2)	ND (1)	2 J	ND (1)	ND (0.0099)	ND (1)	3 J	4 J	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	0.0015
ĺ	11/20/09 03/09/10	22 22	25 16	6 J 4	26 18	79 60	21 8	90 60	ND (10) ND (1)	ND (5) ND (0.5)	ND (5) 1 J	ND (5) ND (0.5)	ND (0.0097) ND (0.0097)	ND (0.057) ND (0.57)	5.0 4.7	3.3	0.18 J ND (0.95)	0.69 ND (0.72)	0.030 J 0.15 J	0.024 J 0.14 J	0.017 J 0.22 J	ND (0.057) ND (0.57)	0.0015 0.0012
ĺ	05/06/10	30	23	5 J	27	85	8 J	82	ND (10)	ND (5)	ND (5)	ND (5)	ND (0.018)	0.092 J	4.4	3.8	0.41	0.72	0.054	0.033 J	0.042	ND (0.057)	0.0012
		-			1				,	1-7	1-7												

Table 2 Sunoco, Inc. Philadelphia Refinery AOI-1: 26th Street North Groundwater Analytical Results Summary

Well Number	Date Collected	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Total BTEX	Methyl Tertiary Butyl Ether (MTBE) (ug/l)	Isopropylbenzene (Cumene) (ug/I)	Naphthalene (ug/I)	1,2,4- Trimethylbenzene (1,2,4-TMB)	1,3,5- Trimethylbenzene (1,3,5-TMB)	1,2-Dichloroethane (EDC) (ug/l)	1,2-Dibromoethane (EDB) (ug/l)	Chrysene (ug/l)	Fluorene (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b) fluoranthene (ug/l)	Benzo(g,h,i)perlene (ug/l)	Dissolved Lead (mg/l)
	11/06/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	02/23/09	4,300	330	910	6,400	11,940	ND (5)	75	430	1,500	690	ND (5)	ND (0.0096)	ND (130)	400	980	ND (1300)	280	ND (42)	8.2	9.1	12 J	0.0053
	06/29/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
S-100	09/09/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/20/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	03/09/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	05/06/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	10/12/04	1,100	7.5	16	68	1,192	ND (5.0)	13	74	NA	NA	ND (5.0)	ND (0.020)	ND (0.14)	ND (10)	ND (10)	ND (10)	NA	NA	NA	NA	NA	ND (0.0050)
	11/06/08	85	16	6	23	130	0.5 J	38	2 J	3	2 J	ND (0.5)	ND (0.010)	ND (10)	NA	37 J	15 J	11 J	ND (10)	ND (10)	ND (10)	ND (10)	0.00086 J
	02/23/09	260	10	23	16	309	ND (3)	29	12 J	4 J	5 J	ND (3)	ND (0.0096)	ND (1.5)	13	11	4.2	2.4	0.9	ND (0.60)	0.57	ND (0.60)	0.00038 J
S-101	06/29/09	330	4	3	3	340	ND (0.5)	24	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.010)	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00035 J
	09/09/09	420	6	5	5	436	0.6 J	33	3 J	1 J	1 J	ND (0.5)	ND (0.0098)	1 J	7	5	5 J	3 J	1 J	ND (1)	ND (1)	ND (1)	0.00070 J
	11/20/09	490	7	ND (3)	3 J	500	ND (3)	23	ND (5)	ND (3)	ND (3)	ND (3)	ND (0.0098)	ND (0.057)	1.4	0.51	0.31 J	0.17	0.025 J	0.019 J	0.020 J	ND (0.057)	0.00045 J
	03/09/10	270	7	2	5	284	ND (0.5)	26	1 J	0.9 J	0.8 J	ND (0.5)	ND (0.0097)	0.065 J	1.6	0.57	0.28 J	0.16	0.035 J	0.024 J	0.030	0.083 J	0.00043 J
	05/06/10	260	6	ND (3)	4 J	270	ND (3)	21	ND (5)	ND (3)	ND (3)	ND (3)	ND (0.018)	ND (0.057)	1.4	0.61	0.23 J	0.13	0.028 J	0.028 J	0.026 J	0.069 J	0.00045 J
	11/06/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	02/24/09	9,000	820	460	6,700	16,980	26,000	100	520	1,800	1,900	ND (5)	ND (0.0097)	ND (50)	190	460	ND (550)	130	ND (18)	2.5	2.2	ND (4.0)	0.0091
S-125	06/26/09	5,100	200	140	2,800	8,240	13,000	40	130	1,000	430	ND (5)	ND (0.0098)	ND (5.0)	17	41	ND (24)	13	0.93	0.25	0.25	0.39	0.0056
0 120	09/08/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/20/09	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	03/08/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	05/05/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	11/06/08	930	13	22	64	1,029	5	19	ND (5)	40	ND (3)	ND (3)	ND (0.0097)	ND (1)	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	0.00097 J
	02/23/09	760	10	15	71	856	4 J	20	ND (5)	21	3 J	ND (3)	ND (0.0095)	ND (0.040)	0.96	0.050 J	ND (0.095)	ND (0.060)	ND (0.0095)	ND (0.0095)	ND (0.0076)	ND (0.057)	0.0013
S-193	06/29/09	210	3	4	21	238	9	16	ND (1)	6	1 J	ND (0.5)	ND (0.0099)	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00033 J
	09/09/09	760	9	37	120	926	30	17	8	44	15	ND (1)	ND (0.0097)	ND (0.9)	ND (0.9)	ND (0.9)	ND (0.9)	ND (0.9)	ND (0.9)	ND (0.9)	ND (0.9)	ND (0.9)	0.00037 J
	11/20/09	930	11	19	81	1,041	9	16	ND (5)	25	11	ND (3)	ND (0.0098)	0.066 J	0.39	ND (0.12)	ND (0.095)	ND (0.065)	0.021 J	0.015 J	0.012 J	ND (0.057)	0.00051 J
	03/09/10	500	6	52	130	688	110	16	4 J	17	7	ND (0.5)	ND (0.0096)	ND (0.057)	0.12 J	ND (0.15)	ND (0.095)	ND (0.025)	ND (0.0095)	ND (0.0095)	ND (0.0076)	ND (0.057)	0.00012 J
	05/06/10	270	3 J	18	63	354	45	9 J	6 J	12	6 J	ND (3)	ND (0.018)	ND (0.058)	ND (0.35)	ND (0.038)	ND (0.096)	ND (0.025)	ND (0.0096)	ND (0.0096)	ND (0.0077)	ND (0.058)	0.00017 J
																							+
	11/06/08	ND (3)	ND (3)	ND (3)	ND (3)	ND	ND (3)	ND (3)	ND (5)	ND (3)	ND (3)	ND (3)	ND (0.0096)	ND (10)	NA	ND (10)	ND (10)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	0.00018 J
	02/23/09	ND (3)	ND (3) ND (0.5)	ND (3) ND (0.5)	ND (3)	ND ND	ND (3)	ND (3)	ND (5)	ND (3) ND (0.5)	ND (3)	ND (3)	ND (0.0096) ND (0.0097)	ND (10) ND (0.039)	ND (0.097)	0.059 J	ND (10) ND (0.097)	ND (1) ND (0.040)	ND (1) ND (0.0097)	ND (1) ND (0.0097)	ND (1) ND (0.0078)	ND (1) ND (0.058)	0.00018 J
	02/23/09	ND (0.5)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND ND	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (1) ND (1)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (0.0097) ND (0.010)	ND (0.039) NA	ND (0.097) NA	0.059 J NA	ND (0.097) NA	ND (0.040) NA	ND (0.0097) NA	NA (0.0097)	ND (0.0078) NA	ND (0.058)	0.00012 J
S-196	06/29/09	ND (0.5)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND ND	ND (0.5)	ND (0.5) ND (0.5)	ND (1) ND (1)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (0.010) ND (0.0098)	ND (1)	ND (1)	NA ND (1)	NA ND (1)	ND (1)	NA ND (1)	NA ND (1)	NA ND (1)	ND (1)	0.00012 J 0.00010 J
	11/20/09	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND ND	ND (0.5)	ND (0.5)	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.0098)	0.063 J	ND (1)	ND (1) ND (0.040)	ND (1)	ND (1) ND (0.020)	0.015 J	0.029 J	0.023 J	ND (0.060)	ND (0.00050)
	03/09/10	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND ND	ND (0.5)	ND (0.5)	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.0098)	ND (0.058)	ND (0.10)	ND (0.040) ND (0.038)	ND (0.10)	ND (0.020) ND (0.019)	ND (0.0096)	ND (0.0096)	ND (0.0077)	ND (0.060)	ND (0.000050)
	05/06/10	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND ND	ND (0.5)	ND (0.5)	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.0096)	ND (0.056)	ND (0.096)	ND (0.036) ND (0.080)	ND (0.096)	ND (0.019)	ND (0.0096)	ND (0.0096)	ND (0.0077)	ND (0.056)	ND (0.000050)
	03/30/10	112 (0.0)	145 (0.5)	145 (0.0)	110 (0.0)	140	112 (0.0)	145 (0.5)	110 (1)	140 (0.0)	110 (0.0)	145 (0.0)	145 (0.010)	(0.12)	110 (0.20)	145 (0.000)	110 (0.20)	112 (0.040)	145 (0.020)	140 (0.020)	145 (0.010)	140 (0.12)	(0.00000)
	03/18/04	ND (5)	ND (5)	ND (5)	ND (5)	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/07/05	ND (1)	ND (1)	ND (1)	ND (1)	ND	ND (1)	ND (1)	ND (1)	NA NA	NA NA	ND (1)	ND (0.02)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	NA NA	NA NA	NA NA	NA NA	NA NA	ND (0.010)
S-197				2/2008, 6/2009,				= (• /	\ ' /			= (1)	(0.02)	(0.2)	(0.2)	(0.2)	(0.2)	1 121					(2.0.0)
	TELE OF HAIVE	. DL LOOMI	2. 11,2000, 2	, 2000, 0/2000,	5,2000, 11/200	00, 0/2010, 0/2							1		l	1	T	l					
													1										1
			1	1		1	1	1						1	1	1	1	1				1	

Table 2
Sunoco, Inc. Philadelphia Refinery
AOI-1: 26th Street North Groundwater Analytical Results Summary

Well Number	Date Collected	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Total BTEX	Methyl Tertiary Butyl Ether (MTBE) (ug/l)	Isopropylbenzene (Cumene) (ug/l)	Naphthalene (ug/l)	1,2,4- Trimethylbenzene (1,2,4-TMB)	1,3,5- Trimethylbenzene (1,3,5-TMB)	1,2-Dichloroethane (EDC) (ug/l)	1,2-Dibromoethane (EDB) (ug/l)	Chrysene (ug/l)	Fluorene (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b) fluoranthene (ug/l)	Benzo(g,h,i)perlene (ug/l)	Dissolved Lead (mg/l)
	11/06/08	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND	ND (0.5)	ND (0.5)	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.0099)	ND (1)	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	0.00019 J
	02/23/09	4	0.6 J	2	18	25	ND (0.5)	ND (0.5)	3 J	12	4	ND (0.5)	ND (0.0095)	ND (0.15)	0.28 J	0.67	ND (0.095)	0.18	ND (0.040)	0.012 J	0.015 J	ND (0.070)	0.00031 J
S-268 (formerly	06/29/09	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND	ND (0.5)	ND (0.5)	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.010)	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00019 J
S-264)	09/09/09 11/20/09	ND (0.5)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND 1	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (1) ND (1)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (0.5) ND (0.5)	ND (0.010) ND (0.0097)	ND (0.9) ND (0.057)	ND (0.9) ND (0.095)	ND (0.9) 0.065 J	ND (0.9) 0.22 J	ND (0.9) 0.046 J	ND (0.9) 0.014 J	ND (0.9) ND (0.0095)	ND (0.9) ND (0.0076)	ND (0.9) ND (0.057)	0.00013 J 0.00016 J
	03/09/10	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND	ND (0.5)	ND (0.5)	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.0096)	0.074 J	ND (0.095)	ND (0.060)	0.20 J	0.032 J	0.050	0.066	0.062	0.062 J	0.00077 J
	05/06/10	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND	ND (0.5)	ND (0.5)	ND (1)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.018)	0.069 J	ND (0.095)	ND (0.10)	0.18 J	0.043 J	ND (0.0095)	ND (0.0095)	0.0080 J	ND (0.057)	0.00030 J
	44/00/00	0.500		450	4.400	4.440	0.40	2.1	222	400	040	ND (0)	ND (0.0007)	0.1	***	07	-	-	0.1	ND (0.0)		ND (0.0)	0.0000
	11/03/08 02/19/09	2,500 1,900	60 33	450 400	1,100 890	4,110 3,223	340 180	94 100	620 680	430 510	210 310	ND (3) ND (10)	ND (0.0097) ND (0.0097)	2 J 1.9	NA 14	27 20	5 8.9	5 3.8	2 J 1.7	ND (0.9) 1.4	1 J	ND (0.9) 0.99	0.0098 0.0101
	06/25/09	2,000	55	330	550	2,935	110	97	430	290	180	ND (0.5)	ND (0.0096)	0.97	18	22	3.7	4.1	0.86	0.61	0.53	0.65	0.0083
S-271	09/08/09	1,100	36	250	370	1,756	36	93	390	160	120	ND (1)	ND (0.0097)	ND (1)	18	19	2 J	4 J	ND (1)	ND (1)	ND (1)	ND (1)	0.0074
	11/23/09	1,200	50	210	300	1,760	12	85	330	120	100	ND (5)	ND (0.0097)	2.4	18	28	7.3	5.2	1.9	1.4	1.2	1.2	0.0074
	03/08/10 05/05/10	560 980	12 29	95 110	130 140	797 1,259	11 38	81 76	170 210	58 58	65 66	ND (5)	ND (0.0097) ND (0.017)	0.62	18 16	17 18	2.7	3.3 2.8	0.51 0.40	0.31	0.29 0.21	0.19 J 0.20	0.0051 0.0064
	03/03/10	960	29	110	140	1,239	36	76	210	56	00	ND (5)	ND (0.017)	0.59	10	10	2.3	2.0	0.40	0.27	0.21	0.20	0.0004
	11/04/08	25	0.9 J	19	45	89	0.6 J	9	10	44	17	ND (0.5)	ND (0.0099)	ND (1)	NA	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	0.00089 J
	02/19/09	7	0.8 J	2	10	20	0.7 J	3	3 J	9	4	ND (0.5)	ND (0.0097)	0.11 J	2.5	0.34	ND (0.60)	0.31	0.057	0.07	0.061	0.063 J	0.00040 J
S-272	06/25/09	4	0.6 J	0.7 J	4	9.3 27	1	3	1 J 4	5 9	2 J	ND (0.5)	ND (0.0095)	0.072 J	2.5	0.54	0.23 J	0.33	0.017 J	ND (0.011)	ND (0.0086)	ND (0.064)	0.00045 J
3-272	09/08/09 11/23/09	15 57	1 J 0.6 J	3 ND (0.5)	8 2	60	0.7 J ND (0.5)	12 3	ND (1)	0.7 J	6 1 J	ND (0.5) ND (0.5)	ND (0.0098) ND (0.0096)	ND (1) 0.066 J	1 J ND (0.10)	ND (1) ND (0.090)	ND (1) 0.37 J	ND (1) ND (0.090)	ND (1) 0.041	ND (1) 0.050	ND (1) 0.048	ND (1) ND (0.060)	0.00074 J 0.00045 J
	03/08/10	4	0.8 J	ND (0.5)	3	7.8	ND (0.5)	10	1 J	1 J	0.8 J	ND (0.5)	ND (0.0097)	ND (0.30)	2.1	0.61 J	ND (0.60)	0.35 J	ND (0.050)	ND (0.050)	0.044 J	ND (0.30)	0.00030 J
	05/05/10	4	0.6 J	ND (0.5)	2	6.6	ND (0.5)	8	ND (1)	0.7 J	ND (0.5)	ND (0.5)	ND (0.018)	0.073 J	1.8	0.47	0.24 J	0.27	0.020 J	0.024 J	0.023 J	ND (0.057)	0.00044 J
	44/04/00	400			470	710	40.1	0.5	00.1	450		ND (5)	ND (0.0000)	ND (t)	***	-	0.1		ND (4)	ND (I)	ND (t)	ND (1)	0.0005
	11/04/08 02/19/09	130 46	14	99	470 81	713 142	10 J 0.8 J	35 8	30 J 6	150 40	61 19	ND (5) ND (0.5)	ND (0.0098) ND (0.0096)	ND (1) 0.57	NA 0.62	7 0.5	3 J ND (2.0)	2 J 0.19	ND (1) 0.36	ND (1) 0.33	ND (1) 0.29	ND (1) 0.27	0.0035 0.0017
	06/25/09	170	20	25	130	345	4	23	10	46	24	ND (0.5)	ND (0.0096)	0.41	2.6	1.7	0.86	0.46	0.24	0.25	0.24	0.27	0.0030
S-273	09/08/09	140	5	39	150	334	1	19	6	53	28	ND (0.5)	ND (0.0097)	ND (1)	2 J	1 J	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	ND (1)	0.0017
	11/23/09	120	8	15	66	209	1 J	22	5	21	11	ND (0.5)	ND (0.0098)	0.21	1.8	1.1	0.39	ND (0.21)	0.12	0.13	0.11	0.12 J	0.0026
	03/08/10 05/05/10	160 510	9	14 41	25 99	202 659	0.8 J ND (3)	12 15	2 J ND (5)	10 16	5 10 J	ND (0.5) ND (3)	ND (0.0096) ND (0.018)	0.16 J 0.068 J	0.63 1.8	0.74 0.92	0.48 0.24 J	0.22	0.11 0.026 J	0.070 0.018 J	0.070 0.012 J	ND (0.058) ND (0.058)	0.00062 J 0.0015
	00/00/10	010	, ,	71	55	000	145 (0)	10	145 (6)	10	100	140 (0)	110 (0.010)	0.000 0	1.0	0.02	0.24 0	0.20	0.020 0	0.0100		142 (0.000)	0.0010
	11/04/08	0.400																					
		2,400	74	150	330	2,954	12,000	81	480	92	110	ND (3)	ND (0.0098)	1 J	NA	23	4 J	4 J	1 J	ND (1)	ND (1)	ND (1)	0.0117
	02/19/09	1,000	47	140	310	1,497	3,100	64	460	98	110	ND (3)	ND (0.0096)	0.57	13	15	2.7	2.6	0.48	0.30	0.25	0.21 J	0.0084
0.074	06/25/09	1,000 1,000	47 67	140 140	310 320	1,497 1,527	3,100 900	64 67	460 400	98 80	110 94	ND (3) ND (1)	ND (0.0096) ND (0.0096)	0.57 0.32	13 13	15 13	2.7 1.5	2.6 2.2	0.48 0.26	0.30 0.15	0.25 0.14	0.21 J 0.15 J	0.0084 0.0080
S-274	06/25/09 09/08/09	1,000 1,000 1,400	47 67 56	140 140 460	310 320 880	1,497 1,527 2,796	3,100 900 360	64 67 86	460 400 300	98 80 190	110 94 140	ND (3) ND (1) ND (3)	ND (0.0096) ND (0.0096) ND (0.0098)	0.57 0.32 2 J	13 13 15	15 13 22	2.7 1.5 6	2.6 2.2 4 J	0.48 0.26 2 J	0.30 0.15 ND (1)	0.25 0.14 1 J	0.21 J 0.15 J ND (1)	0.0084 0.0080 0.0063
S-274	06/25/09	1,000 1,000	47 67	140 140	310 320	1,497 1,527	3,100 900	64 67	460 400	98 80	110 94	ND (3) ND (1)	ND (0.0096) ND (0.0096)	0.57 0.32	13 13	15 13	2.7 1.5	2.6 2.2	0.48 0.26	0.30 0.15	0.25 0.14	0.21 J 0.15 J	0.0084 0.0080
S-274	06/25/09 09/08/09 11/23/09	1,000 1,000 1,400 610	47 67 56 42	140 140 460 130	310 320 880 300	1,497 1,527 2,796 1,082	3,100 900 360 130	64 67 86 66	460 400 300 320	98 80 190 71	110 94 140 81	ND (3) ND (1) ND (3) ND (5)	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097)	0.57 0.32 2 J 1.2	13 13 15 14	15 13 22 20	2.7 1.5 6 4.4	2.6 2.2 4 J 3.3	0.48 0.26 2 J 0.99	0.30 0.15 ND (1) 0.61	0.25 0.14 1 J 0.54	0.21 J 0.15 J ND (1) 0.52	0.0084 0.0080 0.0063 0.0070
S-274	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10	1,000 1,000 1,400 610 600 360	47 67 56 42 66 30	140 140 460 130 1,500 350	310 320 880 300 4,600 1,400	1,497 1,527 2,796 1,082 6,766 2,140	3,100 900 360 130 21 61	64 67 86 66 110 67	460 400 300 320 470 200	98 80 190 71 980 520	110 94 140 81 380 190	ND (3) ND (1) ND (3) ND (5) ND (5) ND (1) ND (5)	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.0096) ND (0.018)	0.57 0.32 2 J 1.2 0.23 0.26	13 13 15 14 4.5 8.1	15 13 22 20 3.4 6.6	2.7 1.5 6 4.4 1.0	2.6 2.2 4 J 3.3 0.88 1.0	0.48 0.26 2 J 0.99 0.19 0.15	0.30 0.15 ND (1) 0.61 0.10 0.10	0.25 0.14 1 J 0.54 0.095 0.072	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056
S-274	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10	1,000 1,000 1,400 610 600 360	47 67 56 42 66 30	140 140 460 130 1,500 350	310 320 880 300 4,600 1,400	1,497 1,527 2,796 1,082 6,766 2,140	3,100 900 360 130 21 61	64 67 86 66 110 67	460 400 300 320 470 200	98 80 190 71 980 520	110 94 140 81 380 190	ND (3) ND (1) ND (3) ND (5) ND (1) ND (5) ND (1) ND (5)	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.018) ND (0.0097)	0.57 0.32 2 J 1.2 0.23 0.26	13 13 15 14 4.5 8.1	15 13 22 20 3.4 6.6	2.7 1.5 6 4.4 1.0 1.1	2.6 2.2 4 J 3.3 0.88 1.0	0.48 0.26 2 J 0.99 0.19 0.15	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9)	0.25 0.14 1 J 0.54 0.095 0.072	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.9)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056
S-274	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10	1,000 1,000 1,400 610 600 360	47 67 56 42 66 30	140 140 460 130 1,500 350	310 320 880 300 4,600 1,400	1,497 1,527 2,796 1,082 6,766 2,140	3,100 900 360 130 21 61	64 67 86 66 110 67	460 400 300 320 470 200	98 80 190 71 980 520	110 94 140 81 380 190	ND (3) ND (1) ND (3) ND (5) ND (5) ND (1) ND (5)	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.0096) ND (0.018)	0.57 0.32 2 J 1.2 0.23 0.26	13 13 15 14 4.5 8.1	15 13 22 20 3.4 6.6	2.7 1.5 6 4.4 1.0	2.6 2.2 4 J 3.3 0.88 1.0	0.48 0.26 2 J 0.99 0.19 0.15	0.30 0.15 ND (1) 0.61 0.10 0.10	0.25 0.14 1 J 0.54 0.095 0.072	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056
S-274 S-275	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09	1,000 1,000 1,400 610 600 360 3,700 1,000	47 67 56 42 66 30 1,900 440	140 140 460 130 1,500 350 580 300	310 320 880 300 4,600 1,400 2,900 1,100	1,497 1,527 2,796 1,082 6,766 2,140 9,080 2,840	3,100 900 360 130 21 61 760	64 67 86 66 110 67 55 30	460 400 300 320 470 200 590 320	98 80 190 71 980 520 640 290	110 94 140 81 380 190	ND (3) ND (1) ND (3) ND (5) ND (1) ND (5) ND (1) ND (5) ND (5) ND (5)	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.0018) ND (0.0097) ND (0.0096)	0.57 0.32 2 J 1.2 0.23 0.26 1 J 0.47	13 13 15 14 4.5 8.1 NA 3.4	15 13 22 20 3.4 6.6	2.7 1.5 6 4.4 1.0 1.1	2.6 2.2 4 J 3.3 0.88 1.0	0.48 0.26 2 J 0.99 0.19 0.15 ND (0.9) 0.42	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9) 0.28	0.25 0.14 1 J 0.54 0.095 0.072 ND (0.9) 0.22	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.9) 0.24	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056
	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09 09/08/09 11/23/09	1,000 1,000 1,400 610 600 360 3,700 1,000 5,900	47 67 56 42 66 30 1,900 440 850	140 140 460 130 1,500 350 580 300 570 720 210	310 320 880 300 4,600 1,400 2,900 1,100 2,300	1,497 1,527 2,796 1,082 6,766 2,140 9,080 2,840 9,620 11,800 2,840	3,100 900 360 130 21 61 760 85 9,000	64 67 86 66 110 67 55 30 62 96	460 400 300 320 470 200 590 320 700 1,100 320	98 80 190 71 980 520 640 290 490 680 240	110 94 140 81 380 190 270 110 200 320 140	ND (3) ND (1) ND (3) ND (5) ND (1) ND (5) ND (10) ND (0.5)	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.0097) ND (0.0097) ND (0.0096) ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0098)	0.57 0.32 2 J 1.2 0.23 0.26 1 J 0.47 0.17 J ND (1) 0.078 J	13 13 15 14 4.5 8.1 NA 3.4 5.4 6 5.0	15 13 22 20 3.4 6.6 12 5.1 5.8 7	2.7 1.5 6 4.4 1.0 1.1 3 J 2.5 0.75 1 J 0.40	2.6 2.2 4 J 3.3 0.88 1.0 2 J 1.2 1.0 1 J 0.74	0.48 0.26 2 J 0.99 0.19 0.15 ND (0.9) 0.42 0.12 ND (1) 0.052	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9) 0.28 0.074 ND (1) 0.028 J	0.25 0.14 1 J 0.54 0.095 0.072 ND (0.9) 0.22 0.065 ND (1) 0.029	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.99 0.24 0.095 J ND (1) ND (0.058)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056 0.0076 0.0098 0.0019 0.0114 0.0123
	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09 09/08/09 11/23/09 03/08/10	1,000 1,000 1,400 610 600 360 3,700 1,000 5,900 7,300 1,700 180	47 67 56 42 66 30 1,900 440 850 880 130 9	140 140 460 130 1,500 350 580 300 570 720 210 38	310 320 880 300 4,600 1,400 2,900 1,100 2,300 2,900 800 90	1,497 1,527 2,796 1,082 6,766 2,140 9,080 2,840 9,620 11,800 2,840 317	3,100 900 360 130 21 61 760 85 9,000 3,000 970 7	64 67 86 66 110 67 55 30 62 96 52 4	460 400 300 320 470 200 590 320 700 1,100 320 35	98 80 190 71 980 520 640 290 490 680 240	110 94 140 81 380 190 270 110 200 320 140 13	ND (3) ND (1) ND (3) ND (5) ND (1) ND (5) ND (0.5) ND (0.5)	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.0097) ND (0.0096) ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0098) ND (0.0096)	0.57 0.32 2 J 1.2 0.23 0.26 1 J 0.47 0.17 J ND (1) 0.078 J 0.075 J	13 13 15 14 4.5 8.1 NA 3.4 5.4 6 5.0 0.42	15 13 22 20 3.4 6.6 12 5.1 5.8 7 4.3 0.46	2.7 1.5 6 4.4 1.0 1.1 3 J 2.5 0.75 1 J 0.40 0.20 J	2.6 2.2 4 J 3.3 0.88 1.0 2 J 1.2 1.0 1 J 0.74 0.12	0.48 0.26 2 J 0.99 0.19 0.15 ND (0.9) 0.42 0.12 ND (1) 0.052 0.048	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9) 0.28 0.074 ND (1) 0.028 J 0.033 J	0.25 0.14 1 J 0.54 0.095 0.072 ND (0.9) 0.22 0.065 ND (1) 0.029 0.031	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.9) 0.24 0.095 J ND (1) ND (0.058) ND (0.058)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056 0.0076 0.0098 0.0019 0.0114 0.0123 0.0020
	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09 09/08/09 11/23/09	1,000 1,000 1,400 610 600 360 3,700 1,000 5,900 7,300 1,700	47 67 56 42 66 30 1,900 440 850 880 130	140 140 460 130 1,500 350 580 300 570 720 210	310 320 880 300 4,600 1,400 2,900 1,100 2,300 2,900 800	1,497 1,527 2,796 1,082 6,766 2,140 9,080 2,840 9,620 11,800 2,840	3,100 900 360 130 21 61 760 85 9,000 3,000 970	64 67 86 66 110 67 55 30 62 96	460 400 300 320 470 200 590 320 700 1,100 320	98 80 190 71 980 520 640 290 490 680 240	110 94 140 81 380 190 270 110 200 320 140	ND (3) ND (1) ND (3) ND (5) ND (1) ND (5) ND (10) ND (0.5)	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.0097) ND (0.0097) ND (0.0096) ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0098)	0.57 0.32 2 J 1.2 0.23 0.26 1 J 0.47 0.17 J ND (1) 0.078 J	13 13 15 14 4.5 8.1 NA 3.4 5.4 6 5.0	15 13 22 20 3.4 6.6 12 5.1 5.8 7	2.7 1.5 6 4.4 1.0 1.1 3 J 2.5 0.75 1 J 0.40	2.6 2.2 4 J 3.3 0.88 1.0 2 J 1.2 1.0 1 J 0.74	0.48 0.26 2 J 0.99 0.19 0.15 ND (0.9) 0.42 0.12 ND (1) 0.052	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9) 0.28 0.074 ND (1) 0.028 J	0.25 0.14 1 J 0.54 0.095 0.072 ND (0.9) 0.22 0.065 ND (1) 0.029	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.99 0.24 0.095 J ND (1) ND (0.058)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056 0.0076 0.0098 0.0019 0.0114 0.0123
	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09 09/08/09 11/23/09 03/08/10	1,000 1,000 1,400 610 600 360 3,700 1,000 5,900 7,300 1,700 180	47 67 56 42 66 30 1,900 440 850 880 130 9	140 140 460 130 1,500 350 580 300 570 720 210 38	310 320 880 300 4,600 1,400 2,900 1,100 2,300 2,900 800 90	1,497 1,527 2,796 1,082 6,766 2,140 9,080 2,840 9,620 11,800 2,840 317	3,100 900 360 130 21 61 760 85 9,000 3,000 970 7	64 67 86 66 110 67 55 30 62 96 52 4	460 400 300 320 470 200 590 320 700 1,100 320 35	98 80 190 71 980 520 640 290 490 680 240	110 94 140 81 380 190 270 110 200 320 140 13	ND (3) ND (1) ND (3) ND (5) ND (1) ND (5) ND (0.5) ND (0.5)	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.0097) ND (0.0096) ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0098) ND (0.0096)	0.57 0.32 2 J 1.2 0.23 0.26 1 J 0.47 0.17 J ND (1) 0.078 J 0.075 J	13 13 15 14 4.5 8.1 NA 3.4 5.4 6 5.0 0.42	15 13 22 20 3.4 6.6 12 5.1 5.8 7 4.3 0.46	2.7 1.5 6 4.4 1.0 1.1 3 J 2.5 0.75 1 J 0.40 0.20 J	2.6 2.2 4 J 3.3 0.88 1.0 2 J 1.2 1.0 1 J 0.74 0.12	0.48 0.26 2 J 0.99 0.19 0.15 ND (0.9) 0.42 0.12 ND (1) 0.052 0.048	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9) 0.28 0.074 ND (1) 0.028 J 0.033 J	0.25 0.14 1 J 0.54 0.095 0.072 ND (0.9) 0.22 0.065 ND (1) 0.029 0.031	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.9) 0.24 0.095 J ND (1) ND (0.058) ND (0.058)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056 0.0076 0.0098 0.0019 0.0114 0.0123 0.0020
	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09 09/08/09 11/23/09 03/08/10	1,000 1,000 1,400 610 600 360 3,700 1,000 5,900 7,300 1,770 180	47 67 56 42 66 30 1,900 440 850 880 130 9	140 140 460 130 1,500 350 580 300 570 720 210 38 43	310 320 880 300 4,600 1,400 2,900 1,100 2,300 2,900 800 90 64	1,497 1,527 2,796 1,082 6,766 2,140 9,080 2,840 9,620 11,800 2,840 317 265	3,100 900 360 130 21 61 760 85 9,000 3,000 970 7	64 67 86 66 110 67 55 30 62 96 52 4	460 400 300 320 470 200 590 320 700 1,100 320 35 39	98 80 190 71 980 520 640 290 490 680 240 30 41	110 94 140 81 380 190 270 110 200 320 140 13 31	ND (3) ND (1) ND (3) ND (5) ND (05) ND (0.5) ND (0.5) ND (3)	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0097) ND (0.018) ND (0.0097) ND (0.0096) ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0098) ND (0.0096) ND (0.0096) ND (0.0096)	0.57 0.32 2 J 1.2 0.23 0.26 1 J 0.47 0.17 J ND (1) 0.078 J 0.097 J	13 13 15 14 4.5 8.1 NA 3.4 5.4 6 5.0 0.42 1.0	15 13 22 20 3.4 6.6 12 5.1 5.8 7 4.3 0.46	2.7 1.5 6 4.4 1.0 1.1 3 J 2.5 0.75 1 J 0.40 0.20 J 0.33 J	2.6 2.2 4 J 3.3 0.88 1.0 2 J 1.2 1.0 1 J 0.74 0.12	0.48 0.26 2 J 0.99 0.19 0.15 ND (0.9) 0.42 0.12 ND (1) 0.052 0.048 0.057	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9) 0.28 0.074 ND (1) 0.028 J 0.033 J 0.042	0.25 0.14 1 J 0.54 0.095 0.072 ND (0.9) 0.22 0.065 ND (1) 0.029 0.031	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.99) 0.24 0.095 J ND (1) ND (0.058) ND (0.057) ND (0.057)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056 0.0076 0.0098 0.0019 0.0114 0.0123 0.0020 0.0023
S-275	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09	1,000 1,000 1,000 1,400 610 600 360 3,700 1,000 5,900 7,300 1,700 180 150 NS NS	47 67 56 42 66 30 1,900 440 850 880 130 9 8	140 140 140 460 130 1,500 350 580 300 570 720 210 38 43 NS NS NS	310 320 880 300 4,600 1,400 2,900 1,100 2,300 2,900 800 90 64 NS NS	1,497 1,527 2,796 1,082 6,766 2,140 9,080 2,840 9,620 11,800 2,840 317 265	3,100 900 360 130 21 61 760 85 9,000 3,000 970 7 9 NS NS	64 67 86 66 110 67 55 30 62 96 52 4 7 J	460 400 300 320 470 200 590 320 700 1,100 320 35 39	98 80 190 71 980 520 640 290 490 680 240 30 41	110 94 140 81 380 190 270 110 200 320 140 13 31 NS NS	ND (3) ND (1) ND (3) ND (5) ND (1) ND (5) ND (10) ND (0.5) ND (0.5) ND (3) NS NS	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.0097) ND (0.0096) ND (0.0096) ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0098) ND (0.0098) ND (0.0096) ND (0.0097) ND (0.0098)	0.57 0.32 2 J 1.2 0.23 0.26 1 J 0.47 0.17 J ND (1) 0.078 J 0.097 J NS NS NS	13 13 15 14 4.5 8.1 NA 3.4 5.4 6 5.0 0.42 1.0 NS NS	15 13 22 20 3.4 6.6 12 5.1 5.8 7 4.3 0.46 1.1 NS NS	2.7 1.5 6 4.4 1.0 1.1 3 J 2.5 0.75 1 J 0.40 0.20 J 0.33 J NS NS NS	2.6 2.2 4 J 3.3 0.88 1.0 2 J 1.2 1.0 1 J 0.74 0.12 0.21 NS NS	0.48 0.26 2 J 0.99 0.19 0.15 ND (0.9) 0.42 0.12 ND (1) 0.052 0.048 0.057	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9) 0.28 0.074 ND (1) 0.028 J 0.033 J 0.042 NS NS	0.25 0.14 1 J 0.54 0.095 0.072 ND (0.9) 0.22 0.065 ND (1) 0.029 0.031 0.030 NS NS	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.9) 0.24 0.095 J ND (1) ND (0.058) ND (0.057) ND (0.057) ND (0.057)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056 0.0076 0.0098 0.0019 0.0114 0.0123 0.0020 0.0023
	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09	1,000 1,000 1,000 1,400 610 600 360 3,700 1,000 5,900 7,300 1,700 180 150 NS NS NS	47 67 56 42 66 30 1,900 440 850 880 130 9 8	140 140 140 460 130 1,500 350 580 300 570 720 210 38 43 NS NS NS	310 320 880 300 4,600 1,400 2,900 1,100 2,300 2,900 800 90 64 NS NS NS	1,497 1,527 2,796 1,082 6,766 2,140 9,080 2,840 9,620 11,800 2,840 317 265 NS NS	3,100 900 360 130 21 61 760 85 9,000 3,000 970 7 9 NS NS	64 67 86 66 110 67 55 30 62 96 52 4 7 J	460 400 300 320 470 200 590 320 700 1,100 320 35 39	98 80 190 71 980 520 640 290 490 680 240 30 41 NS NS	110 94 140 81 380 190 270 110 200 320 140 13 31 NS NS NS	ND (3) ND (1) ND (3) ND (5) ND (1) ND (5) ND (5) ND (5) ND (5) ND (5) ND (5) ND (10) ND (0.5) ND (0.5) ND (3) NS NS NS	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.0097) ND (0.0096) ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0098) ND (0.0098) ND (0.0096) ND (0.0097) ND (0.0098)	0.57 0.32 2 J 1.2 0.23 0.26 1 J 0.47 0.17 J ND (1) 0.078 J 0.097 J NS NS NS	13 13 14 4.5 8.1 NA 3.4 5.4 6 5.0 0.42 1.0 NS NS NS	15 13 22 20 3.4 6.6 12 5.1 5.8 7 4.3 0.46 1.1 NS NS NS	2.7 1.5 6 4.4 1.0 1.1 3 J 2.5 0.75 1 J 0.40 0.20 J 0.33 J NS NS NS	2.6 2.2 4 J 3.3 0.88 1.0 2 J 1.2 1.0 1 J 0.74 0.12 0.21 NS NS NS	0.48 0.26 2 J 0.99 0.19 0.15 ND (0.9) 0.42 0.12 ND (1) 0.052 0.048 0.057 NS NS	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9) 0.28 0.074 ND (1) 0.028 J 0.033 J 0.042 NS NS NS	0.25 0.14 1 J 0.54 0.095 0.072 ND (0.9) 0.22 0.065 ND (1) 0.029 0.031 0.030 NS NS NS	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.99 0.24 0.095 J ND (1) ND (0.058) ND (0.057) ND (0.057) ND (0.057)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056 0.0076 0.0098 0.0019 0.0114 0.0123 0.0020 0.0023 NS NS
S-275	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09 03/08/10 05/05/10 11/23/09 03/08/10 05/05/10	1,000 1,000 1,400 610 600 360 3,700 1,000 5,900 7,300 1,770 180 150 NS NS NS NS	47 67 56 42 66 30 1,900 440 850 880 130 9 8	140 140 140 140 460 130 1,500 350 580 300 570 720 210 38 43 NS NS NS NS	310 320 880 300 4,600 1,400 2,900 1,100 2,300 2,900 800 90 64 NS NS NS	1,497 1,527 2,796 1,082 6,766 2,140 9,080 2,840 9,620 11,800 2,840 317 265 NS NS NS	3,100 900 360 130 21 61 760 85 9,000 3,000 970 7 9 NS NS NS NS	64 67 86 66 110 67 55 30 62 96 52 4 7 J NS NS NS	460 400 300 320 470 200 590 320 700 1,100 320 35 39 NS NS NS	98 80 190 71 980 520 640 290 490 680 240 30 41 NS NS NS NS	110 94 140 81 380 190 270 110 200 320 140 13 31 NS NS NS NS	ND (3) ND (1) ND (3) ND (1) ND (3) ND (5) ND (1) ND (5) ND (5) ND (5) ND (5) ND (0.5) ND (0.5) ND (0.5) ND (3) NS NS NS NS	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0097) ND (0.0096) ND (0.018) ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0098) ND (0.0098) ND (0.0096) ND (0.0097) ND (0.0096) ND (0.0098)	0.57 0.32 2 J 1.2 0.23 0.26 1 J 0.47 0.17 J ND (1) 0.078 J 0.097 J NS NS NS NS	13 13 14 4.5 8.1 NA 3.4 5.4 6 6 5.0 0.42 1.0 NS NS NS NS	15 13 22 20 3.4 6.6 12 5.1 5.8 7 4.3 0.46 1.1 NS NS NS NS	2.7 1.5 6 4.4 1.0 1.1 3 J 2.5 0.75 1 J 0.40 0.20 J 0.33 J NS NS NS NS	2.6 2.2 4 J 3.3 0.88 1.0 2 J 1.2 1.0 1 J 0.74 0.12 0.21 NS NS NS NS	0.48 0.26 2 J 0.99 0.19 0.15 ND (0.9) 0.42 0.12 ND (1) 0.052 0.048 0.057 NS NS NS NS	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9) 0.28 0.074 ND (1) 0.028 J 0.033 J 0.042 NS NS NS NS	0.25 0.14 1 J 0.54 0.095 0.072 ND (0.9) 0.22 0.065 ND (1) 0.029 0.031 0.030 NS NS NS NS NS	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.058) ND (0.095 0.24 0.095 J ND (1) ND (0.057) ND (0.057) ND (0.057) NS NS NS NS	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056 0.0076 0.0098 0.0019 0.0114 0.0123 0.0020 0.0023 NS NS NS NS
S-275	06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09 09/08/09 11/23/09 03/08/10 05/05/10 11/04/08 02/19/09 06/25/09	1,000 1,000 1,000 1,400 610 600 360 3,700 1,000 5,900 7,300 1,700 180 150 NS NS NS	47 67 56 42 66 30 1,900 440 850 880 130 9 8	140 140 140 460 130 1,500 350 580 300 570 720 210 38 43 NS NS NS	310 320 880 300 4,600 1,400 2,900 1,100 2,300 2,900 800 90 64 NS NS NS	1,497 1,527 2,796 1,082 6,766 2,140 9,080 2,840 9,620 11,800 2,840 317 265 NS NS	3,100 900 360 130 21 61 760 85 9,000 3,000 970 7 9 NS NS	64 67 86 66 110 67 55 30 62 96 52 4 7 J	460 400 300 320 470 200 590 320 700 1,100 320 35 39	98 80 190 71 980 520 640 290 490 680 240 30 41 NS NS	110 94 140 81 380 190 270 110 200 320 140 13 31 NS NS NS	ND (3) ND (1) ND (3) ND (5) ND (1) ND (5) ND (5) ND (5) ND (5) ND (5) ND (5) ND (10) ND (0.5) ND (0.5) ND (3) NS NS NS	ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0097) ND (0.0096) ND (0.0097) ND (0.0096) ND (0.0096) ND (0.0096) ND (0.0098) ND (0.0098) ND (0.0098) ND (0.0096) ND (0.0097) ND (0.0098)	0.57 0.32 2 J 1.2 0.23 0.26 1 J 0.47 0.17 J ND (1) 0.078 J 0.097 J NS NS NS	13 13 14 4.5 8.1 NA 3.4 5.4 6 5.0 0.42 1.0 NS NS NS	15 13 22 20 3.4 6.6 12 5.1 5.8 7 4.3 0.46 1.1 NS NS NS	2.7 1.5 6 4.4 1.0 1.1 3 J 2.5 0.75 1 J 0.40 0.20 J 0.33 J NS NS NS	2.6 2.2 4 J 3.3 0.88 1.0 2 J 1.2 1.0 1 J 0.74 0.12 0.21 NS NS NS	0.48 0.26 2 J 0.99 0.19 0.15 ND (0.9) 0.42 0.12 ND (1) 0.052 0.048 0.057 NS NS	0.30 0.15 ND (1) 0.61 0.10 0.10 ND (0.9) 0.28 0.074 ND (1) 0.028 J 0.033 J 0.042 NS NS NS	0.25 0.14 1 J 0.54 0.095 0.072 ND (0.9) 0.22 0.065 ND (1) 0.029 0.031 0.030 NS NS NS	0.21 J 0.15 J ND (1) 0.52 ND (0.058) ND (0.058) ND (0.99 0.24 0.095 J ND (1) ND (0.058) ND (0.057) ND (0.057) ND (0.057)	0.0084 0.0080 0.0063 0.0070 0.0112 0.0056 0.0076 0.0098 0.0019 0.0114 0.0123 0.0020 0.0023 NS NS

Table 2 Sunoco, Inc. Philadelphia Refinery AOI-1: 26th Street North Groundwater Analytical Results Summary

Well Number	Date Collected	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Total Xylenes (ug/l)	Total BTEX	Methyl Tertiary Butyl Ether (MTBE) (ug/l)	Isopropylbenzene (Cumene) (ug/I)	Naphthalene (ug/l)	1,2,4- Trimethylbenzene (1,2,4-TMB)	1,3,5- Trimethylbenzene (1,3,5-TMB)	1,2-Dichloroethane (EDC) (ug/l)	1,2-Dibromoethane (EDB) (ug/l)	Chrysene (ug/l)	Fluorene (ug/l)	Phenanthrene (ug/l)	Pyrene (ug/l)	Anthracene (ug/l)	Benzo(a)anthracene (ug/l)	Benzo(a)pyrene (ug/l)	Benzo(b) fluoranthene (ug/l)	Benzo(g, h,i)perlene (ug/l)	Dissolved Lead (mg/l)
	11/04/08	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	02/19/09	3,000	1,100	440	2,800	7,340	130,000	76	310	930	390	ND (10)	ND (0.0096)	ND (1.5)	9.9	16	ND (16)	ND (3.5)	ND (0.5)	0.15	0.13	0.13 J	0.0083
	06/26/09	2,300	720	96	730	3,846	22,000	52	59	190	76	ND (5)	ND (0.016)	0.11 J	4.3	4.4	ND (0.095)	0.82	0.033 J	0.019 J	0.017 J	ND (0.057)	0.0037
S-277	09/08/09	2,600	930	75	690	4,295	25,000	42	51	160	71	ND (5)	ND (0.0099)	ND (0.9)	4 J	5	ND (0.9)	ND (0.9)	ND (0.9)	ND (0.9)	ND (0.9)	ND (0.9)	0.0043
	11/23/09	1,100	320	75	420	1,915	2,500	73	36	100	53	ND (0.5)	ND (0.0099)	0.86	7.8	12	ND (0.099)	ND (2.5)	0.33	0.16	0.16	0.18 J	0.0054
	03/08/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	05/05/10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

NOTES:

µg/l = micrograms per liter

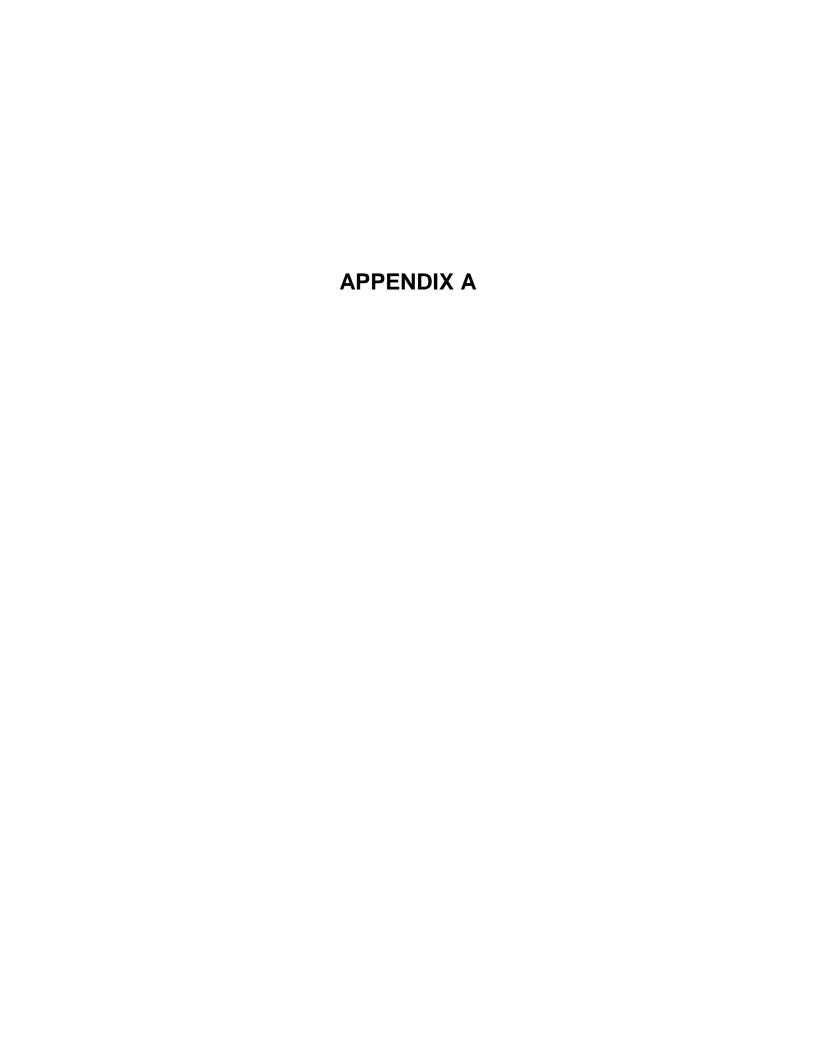
mg/l = milligrams per liter

ND (100) = Compound not detected above the method detection limit provided in parentheses

NA = Compound not analyzed by laboratory

NS = Well not sampled due to presence of LNAPL

J = Indicates an estimated value below the laboratory reporting limit



Sunoco, Inc. Philadelphia Refinery Groundwater and LNAPL Recovery Systems Operational Data AOI 1: Belmont Terminal

Second Quarter 2010

	Gro	und Water Recove	ry	LNAPL I	Recovery
Date	Total Recovery (gallons)	Recovery For Period (gallons)	Average Flow Rate (gpm)	Period Total (gallons)	Cumulative (gallons)
9-Apr-10	56,719,066	208,613	20.70	16.2	245,209
16-Apr-10	56,810,933	91,867	9.11	0.0	245,209
23-Apr-10	56,943,180	132,247	13.12	0.0	245,209
30-Apr-10	57,037,037	93,857	9.31	0.0	245,209
7-May-10	57,128,788	91,751	9.10	0.0	245,209
14-May-10	57,192,639	63,851	6.33	0.0	245,209
21-May-10	57,192,684	45	0.00	0.0	245,209
28-May-10	57,387,091	194,407	19.29	10.9	245,220
4-Jun-10	57,555,320	168,229	16.69	10.9	245,231
11-Jun-10	57,790,026	234,706	23.28	10.9	245,242
18-Jun-10	58,008,126	218,100	21.64	10.9	245,253
25-Jun-10	58,266,278	258,152	25.61	10.6	245,263
30-Jun-10	58,526,666	260,388	36.17	9.9	245,273

NOTES:

LNAPL: Light Non-Aqueous Phase Liquid

gpm: gallons per minute

The Belmont Terminal System consists of the Loading Rack System (RW-21, RW-22, RW-23, RW-24, and RW-25) and the Frontage Road System (RW-15 and RW-26 through RW-32). The Belmont System currently has 2 totalizers: one for the Loading Rack and one for Frontage Road. The volume of groundwater reported is the total for both totalizers combined.

Due to a discharge line issue, the Frontage Road System was shutdown on September 11, 2009 and it was restarted for a test run on April 16, 2010. On May 11th, both of the systems were shut-down to complete the main discharge line upgrade to 3-inch HDPE and both systems were restarted on May 17. The Loading Rack System was operational throughout the reporting period. All water pumps (RW-21 through RW-24) were active although RW-23 and RW-24 are the only product pumps currently active due to limited presence of LNAPL.

Sunoco, Inc. Philadelphia Refinery Total Fluids Recovery System Operational Data AOI 1: 26th Street Sewer Area

Second Quarter 2010

Date	Total Flow (gallons)	Period Total Flow (gallons)	Calculated System Flow Rate (gpm)	LNAPL Recovered in Period (gallons)	Total LNAPL Recovered (gallons)
9-Apr-10	32,523,216	102,606	10.18	NA	8,849.60
16-Apr-10	32,523,270	54	0.01	NA	8,849.60
23-Apr-10	32,528,564	5,294	0.53	NA	8,849.60
30-Apr-10	32,586,750	58,186	5.77	NA	8,849.60
7-May-10	32,694,970	108,220	10.74	NA	8,849.60
14-May-10	32,775,048	80,078	7.94	NA	8,849.60
21-May-10	32,838,492	63,444	6.29	NA	8,849.60
28-May-10	33,064,172	225,680	22.39	NA	8,849.60
4-Jun-10	33,378,894	314,722	31.22	NA	8,849.60
11-Jun-10	33,635,255	256,361	25.43	NA	8,849.60
18-Jun-10	33,910,079	274,824	27.26	NA	8,849.60
25-Jun-10	34,006,086	96,007	9.52	NA	8,849.60
30-Jun-10	34,046,386	40,300	5.60	NA	8,849.60

NOTES:

LNAPL: Light Non-Aqueous Phase Liquid

gpm: gallon per minute

The total flow and total LNAPL recovered includes historical totals from former recovery wells RW-400 through RW-406.

The system discharges directly to a benzene NESHAP controlled sewer; therefore, volume of recovered LNAPL cannot be quantified. The system was restarted on April 2, 2010 with 10 recovery wells pumping. The flowmeter was found clogged the week of April 16th. Ten pumps remained active until the system was shut-off May 11th to upgrade the main discharge line. Upon completion of the upgrade on May 17, 2010, all 14 onsite pumps were restarted and were operational for the remainder of the reporting period. None of the 5 CSX wells were active during the reporting period due to absence of product.

Sunoco, Inc. Philadelphia Refinery AOI 1: 26th Street & Packer Avenue Sewers Biofilter System pH Data

Second Quarter 2010

Date	Leachate pH		Biofilter Be	ed - Soil pH	
Date	Leachate pri	1.0	2.0	3.0	4.0
30-Apr-10	6.4				
28-May-10	6.8				
30-Jun-10	6.9	6.9	6.8	NA	NA

NOTES:

The system was opertional throughout the reporting period.

Leachate recordings are collected on a monthly basis.

Media pH recordings are collected on a quarterly basis.

NA: Not Applicable; treatment beds 3 and 4 were shut-off June 18, 2010.

Sunoco, Inc. Philadelphia Refinery AOI-1: 26th Street & Packer Avenue Sewers Biofilter System Organic Vapor Concentrations

Second Quarter 2010

	Bi	ofilter Influe	nt				Biofilter	Effluent			
Date	Packer Ave. (ppm)	26 th Street (ppm)	ST-1 (Combined Influent) (ppm)	Cell-1N	Cell-1S	Cell-2N	Cell-2S	Cell-3N	Cell-3S	Cell-4N	Cell-4S
09-Apr-10	0.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16-Apr-10	0.0	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23-Apr-10	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30-Apr-10	0.0	8.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
07-May-10	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14-May-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21-May-10	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28-May-10	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
04-Jun-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11-Jun-10	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18-Jun-10	0.0	11.6	0.0	0.0	0.0	0.0	0.0	NA	NA	NA	NA
25-Jun-10	0.0	5.5	0.0	0.0	0.0	0.0	0.0	NA	NA	NA	NA
30-Jun-10	0.0	11.3	0.0	0.0	0.0	0.0	0.0	NA	NA	NA	NA

NOTES: ppm: parts per million

Readings are collected using a ThermoEnvironmental Photoionization Detector (PID).

The system was operational throughout the reporting period. A drip irrigation system was installed on June 18,

2010 to aid in retention of moisture in the treatment cells. At the same time, treatment beds 3 and 4 were

shut-down as they are not currently needed for vapor treatment.

NA: Not applicable

Sunoco, Inc. Philadelphia Refinery Total Fluids Recovery System Operational Data AOI 2: Pollock Street Vertical Wells

Second Quarter 2010

		RW-101			RW-102			RW-103	
Date	Total Fluids Extracted During Period (gallons)	Total Fluids Extracted (gallons)	Average Flow Rate (gpm)	Total Fluids Extracted During Period (gallons)	Total Fluids Extracted (gallons)	Average Flow Rate (gpm)	Total Fluids Extracted During Period (gallons)	Total Fluids Extracted (gallons)	Average Flow Rate (gpm)
9-Apr-10	48,640	5,123,400	4.83	12,980	4,684,419	1.29	36,200	2,221,370	3.59
16-Apr-10	57,260	5,180,660	5.68	2,600	4,687,019	0.26	28,730	2,250,100	2.85
23-Apr-10	44,360	5,225,020	4.40	6,270	4,693,289	0.62	26,380	2,276,480	2.62
30-Apr-10	0	5,225,020	0.00	190	4,693,479	0.02	24,600	2,301,080	2.44
7-May-10	0	5,225,020	0.00	0	4,693,479	0.00	17,730	2,318,810	1.76
14-May-10	0	5,225,020	0.00	10	4,693,489	0.00	25,410	2,344,220	2.52
21-May-10	6,940	5,231,960	0.69	0	4,693,489	0.00	21,230	2,365,450	2.11
28-May-10	52,210	5,284,170	5.18	0	4,693,489	0.00	22,460	2,387,910	2.23
4-Jun-10	48,330	5,332,500	4.79	16,320	4,709,809	1.62	24,290	2,412,200	2.41
11-Jun-10	26,300	5,358,800	2.61	4,760	4,714,569	0.47	14,830	2,427,030	1.47
18-Jun-10	56,820	5,415,620	5.64	31,330	4,745,899	3.11	33,240	2,460,270	3.30
25-Jun-10	18,232	5,433,852	1.81	18,520	4,764,419	1.84	26,340	2,486,610	2.61
30-Jun-10	20,308	5,454,160	2.82	16,720	4,781,139	2.32	22,250	2,508,860	3.09

		RW-104			RW-105			RW-106	
Date	Total Fluids Extracted During Period (gallons)	Total Fluids Extracted (gallons)	Average Flow Rate (gpm)	Total Fluids Extracted During Period (gallons)	Total Fluids Extracted (gallons)	Average Flow Rate (gpm)	Total Fluids Extracted During Period (gallons)	Total Fluids Extracted (gallons)	Average Flow Rate (gpm)
9-Apr-10	0	3,725,910	0.00	3,310	285,820	0.33	113,990	16,335,099	11.31
16-Apr-10	0	3,725,910	0.00	1,090	286,910	0.11	90,870	16,425,969	9.01
23-Apr-10	0	3,725,910	0.00	990	287,900	0.10	86,190	16,512,159	8.55
30-Apr-10	0	3,725,910	0.00	1,400	289,300	0.14	89,420	16,601,579	8.87
7-May-10	0	3,725,910	0.00	690	289,990	0.07	62,970	16,664,549	6.25
14-May-10	0	3,725,910	0.00	710	290,700	0.07	89,730	16,754,279	8.90
21-May-10	0	3,725,910	0.00	1,070	291,770	0.11	45,490	16,799,769	4.51
28-May-10	0	3,725,910	0.00	1,010	292,780	0.10	62,940	16,862,709	6.24
4-Jun-10	0	3,725,910	0.00	1,230	294,010	0.12	61,720	16,924,429	6.12
11-Jun-10	0	3,725,910	0.00	440	294,450	0.04	60,360	16,984,789	5.99
18-Jun-10	0	3,725,910	0.00	950	295,400	0.09	149,570	17,134,359	14.84
25-Jun-10	0	3,725,910	0.00	510	295,910	0.05	97,710	17,232,069	9.69
30-Jun-10	0	3,725,910	0.00	410	296,320	0.06	70,690	17,302,759	9.82

NOTES:

gpm: gallons per minute

The system discharges total fluids directly to a benzene NESHAP controlled sewer; therefore, recovered LNAPL volume cannot be calculated.

The reported volume recovered for total fluids accounts for the historical recovery for each system.

All vertical recovery wells were operational throughout the reporting period with the following exceptions. RW-104 is no longer operating due to historically low LNAPL recovery volumes from this area. The flow meter in RW-101 was replaced on May 19, 2010. The pump in RW-102 failed the week of May 7th and was replaced on May 19th. RW-101 through RW-106 were turned off from May 14th to May 19th for a leak repair at RW-107 (inactive). At RW-102, the pump and motor were replaced on May 28th and a new flow meter was installed on June 11, 2010.

RW-100 was restarted on June 15, 2010 and during this reporting period a total of 56,120 gallons of total fluids was recovered. Weekly detail and cumulative totals will be provided for RW-100 in the next quarterly report.

Sunoco, Inc. Philadelphia Refinery LNAPL Recovery System Operational Data AOI 4: S-30 & S-36

Second Quarter 2010

	S-	30	S-:	36
Date	LNAPL Recovered in Period (gallons)	Total LNAPL Recovered (gallons)	LNAPL Recovered in Period (gallons)	Total LNAPL Recovered (gallons)
9-Apr-10	0	39,623	0	1,013
16-Apr-10	0	39,623	0	1,013
23-Apr-10	0	39,623	0	1,013
30-Apr-10	0	39,623	0	1,013
7-May-10	0	39,623	0	1,013
14-May-10	0	39,623	3	1,016
21-May-10	0	39,623	0	1,016
28-May-10	0	39,623	0	1,016
4-Jun-10	0	39,623	2	1,017
11-Jun-10	6	39,629	0	1,017
18-Jun-10	9	39,638	0	1,018
25-Jun-10	0	39,638	7	1,025
30-Jun-10	0	39,638	0	1,025

NOTES:

LNAPL: Light Non-Aqueous Phase Liquid

The reported volume recovered for total fluids accounts for the historical recovery for each system.

There is no groundwater recovery at S-30 and S-36; these are product skimming systems only.

The S-36 LNAPL recovery system includes recovery wells S-34, S-35, and S-36. The S-36 system was restarted on April 13, 2010 with pumps in S-35 and S-36 only; S-34 was not restarted due to absence of measureable product. The S-36 system was operational throughout the reporting period except May 11th to May 20th when the compressor belt failed and was replaced.

S-30 was operational during the reporting period until May 20, 2010 when the probe was found broken. The product pump was replaced on June 9th; however, the water sensor is awaiting repair/replacement.

Sunoco, Inc. Philadelphia Refinery Groundwater and LNAPL Recovery System Operational Data AOI 6: 27 Pump House

Second Quarter 2010

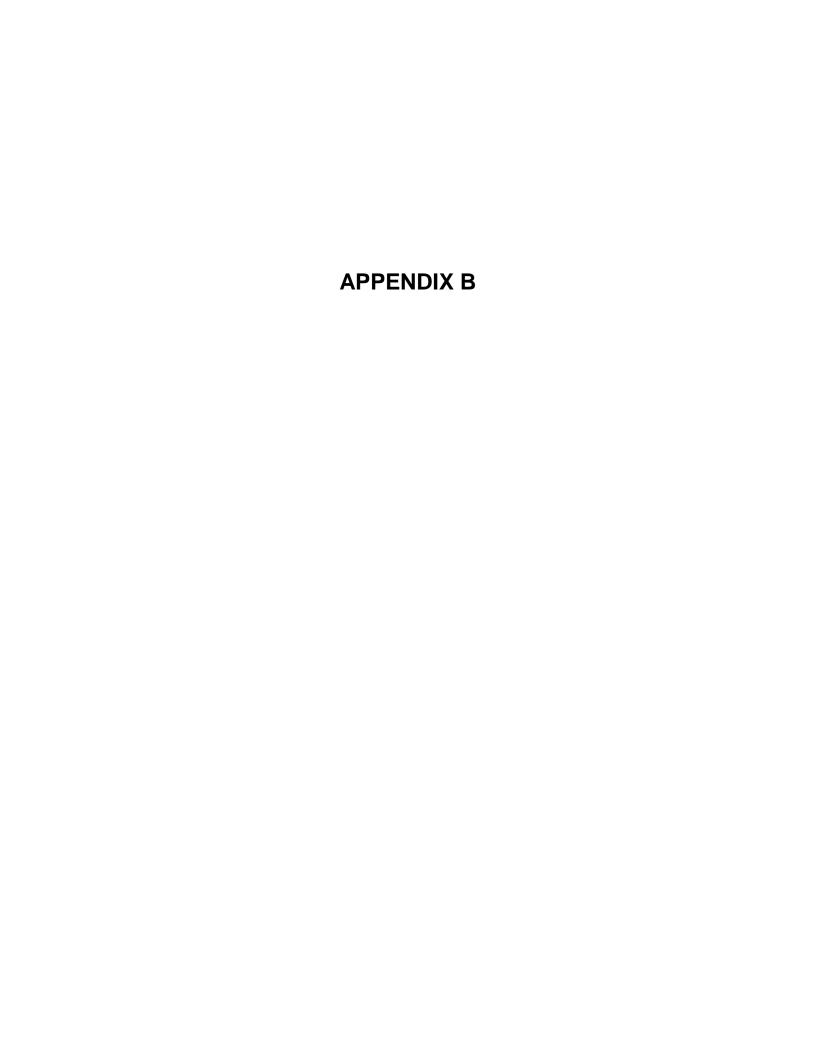
Date	Water Recovered During Period (gallons)	Total Water Extracted (gallons)	Average Flow Rate (gpm)	LNAPL Recovered During Period (gallons)	Total LNAPL Recovered (gallons)
09-Apr-10	0	10,284,475	0.00	0.00	12,761.25
16-Apr-10	0	10,284,475	0.00	0.00	12,761.25
23-Apr-10	23,800	10,308,275	0.79	0.00	12,761.25
30-Apr-10	51,500	10,359,775	2.49	0.00	12,761.25
07-May-10	26,000	10,385,775	3.35	0.00	12,761.25
14-May-10	40,400	10,426,175	3.90	0.00	12,761.25
21-May-10	26,600	10,452,775	3.08	0.00	12,761.25
28-May-10	14,000	10,466,775	2.68	0.00	12,761.25
04-Jun-10	23,400	10,490,175	2.12	0.00	12,761.25
11-Jun-10	10,500	10,500,675	1.58	0.00	12,761.25
18-Jun-10	23,600	10,524,275	1.90	0.00	12,761.25
25-Jun-10	15,700	10,539,975	1.65	0.38	12,761.63
30-Jun-10	11,800	10,551,775	1.87	0.00	12,761.63

NOTES:

LNAPL: Light Non-Aqueous Phase Liquid

gpm: gallons per minute

The 27 Pump House system was restarted on April 19, 2010 with active pumping from B-124, B-139, B-142, and B-143. On May 25th, the pumps at B-124 and B-139 were not operating upon arrival and were restarted. On June 15th, the compressor belts were found to be destroyed and were replaced with new belts on June 16, 2010.





PERFORMANCE MONITORING AND QUARTERLY UPDATE 26TH STREET SOUTH (AOI-1)

SUNOCO, INC (R&M) PHILADELPHIA REFINERY PHILADELPHIA, PA

July 2010

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1.0 INTRODUCTION

The information contained in this report is intended to be included as an Attachment to the Quarterly Remediation Status Report for the Philadelphia Refinery and Belmont Terminal prepared by Stantec. The area investigated by Aquaterra and summarized in this report includes the southern portion of AOI-1, also known as the #2 Tank Farm or the 26th Street South area. Historic sampling of groundwater in this area had been sporadic; however, over the course of the sampling history relatively high occurrences of benzene have been reported. Therefore, as proposed previously, Aquaterra initiated quarterly sampling of select monitoring wells across the area to provide further definition of the extent of the light non-aqueous phase liquids (LNAPL) and dissolved phase constituents of concern (COCs) in groundwater. This report also provides a summary of the remediation system operation, maintenance and sampling activities.

2.0 GROUNDWATER SAMPLING

2.1 Sampling Methodology

On 1 June 2010, select monitoring wells (8 total) within the 26th Street South study area were gauged and sampled. Prior to sampling, depth to water measurements were collected for use in calculating groundwater elevations and for the generation of a groundwater gradient map (**Figure 1**). Depths to water ranged from 16.52 (S-117) to 23.68 (S-210) feet below top of casing. The groundwater gradient map illustrates groundwater flow to the east. One well (S-226) reported the presence of separate phase hydrocarbons (SPH) at a thickness of 2.67 feet during the gauging event. This well is in the vicinity of S-210, which has historically had SPH. However, this is the first quarter of SPH in well S-226. As noted below, the well was also gauged as part of the performance monitoring activities and to confirm the anomalous thickness, and was recorded at much smaller thicknesses (see Section 3.2). Groundwater gauging information performed as part of the groundwater sampling is summarized in **Table 1**.

Sampling of wells was performed using low-flow techniques which included a peristaltic pump and a YSI 556 meter with a flow-through cell for recording field parameters as discussed in Section 3.2. The exception to this was sampling S-210 and S-230, which were sampled following the three well volume purge protocol for groundwater sampling (using a whale pump at approximately one gallon per minute [gpm]).

Generally, all quarterly samples are submitted to Lancaster Laboratories, Inc. (Lancaster) for analysis of the following COCs: benzene, toluene, ethylbenzene, xylenes (BTEX), and methyl tertiary-butyl ether (MTBE) via Method 8260B. However, only two well samples (S-210 and S-230) during this event were analyzed for the referenced parameters. Laboratory analytical data and chain of custody are included as **Attachment A**.

2.2 Sampling Results

Laboratory data indicate that toluene, ethylbenzene, and total xylenes were not reported above their respective Pennsylvania Department of Environmental Protection (PADEP) Act 2 Statewide Health Standard (SHS) Medium Specific Concentrations (MSCs) in the well locations that were sampled. Benzene exceeded the SHS MSC in both wells, and MTBE exceeded in well S-210 only. Laboratory data are summarized in **Table 1**.



2.3 Future Sampling Activities

Monthly sampling of the monitoring wells proximal to the system was adjusted to a quarterly schedule, starting with 1st quarter 2010. The select wells utilized for monitoring of attenuation parameters and microbial analysis (as discussed in Section 3.3) were sampled on a quarterly basis for the first half of 2010, and will most likely be adjusted to an annual basis from this point forward. The site wells that were previously sampled on a quarterly basis for semi-volatile organic compounds (SVOCs) and dissolved lead were dropped from the sampling that Aquaterra performs in this area. However, Stantec continues to monitor and sample select wells along the property boundary as part of their annual perimeter sampling program, which includes wells S-41, S-43, S-44, S-50, S-51, S-226, and S-232.

3.0 REMEDIATION ACTIVITIES

3.1 Oxygen Injection System

Between January and March 2009, 54 nested injection points within 27 well boreholes (at each well location there is one shallow and one deep) were installed as part of the oxygen injection remediation system. Deep injection points range in depth from 29 to 41 feet below grade, and shallow injection points range in depth from 25 to 33.5 feet below grade, each with two feet of slotted screen. The nested configuration was utilized due to aquifer heterogeneity and the presence of clay layers which may inhibit the movement of oxygen to the impacted zones. The goal of the remediation system is to provide a barrier against offsite migration of the COCs within the aquifer.

Four 'banks' of wells were set to inject into multiple wells at a time so that oxygen is pulsed into the aquifer. This pulsing of the system aids in transfer of oxygen from the vapor to dissolved phase, and the low flow rate allows for maximum DO saturation without causing contaminant volatilization. The system was initially set up to only inject within the deep points (except at IW-01, where there was blockage in the deep point); however, due to lower than projected target DO concentrations in surrounding monitoring wells, the system was adjusted on 18 November 2009 to inject into the shallow points so that DO injection was being performed closer to the monitoring well screen intervals. Injection wells IW-17, IW-18 and IW-19 remain as deep injection points due to the deeper well screen construction of S-232. On 14 January 2010, IP-25 was switched back to the deep well due to loss of pressure in the shallow well. Injection well locations are illustrated on **Figure 2**.

3.2 Operation and Maintenance

Routine operation and maintenance (O&M) activities are generally conducted by Aquaterra on a bi-weekly basis, during which Aquaterra records system operation information including system run time and operating pressures. Adjustments are made during each visit to maintain optimal operating conditions. Injection pressures are measured at each point during these visits and adjusted to approximately 30 standard cubic feet per hour (scfh). Oxygen purity is also measured during each visit; during this period the oxygen purity ranged from 80 to 82 percent (%). There were no breaks in operation of the system during this quarter.



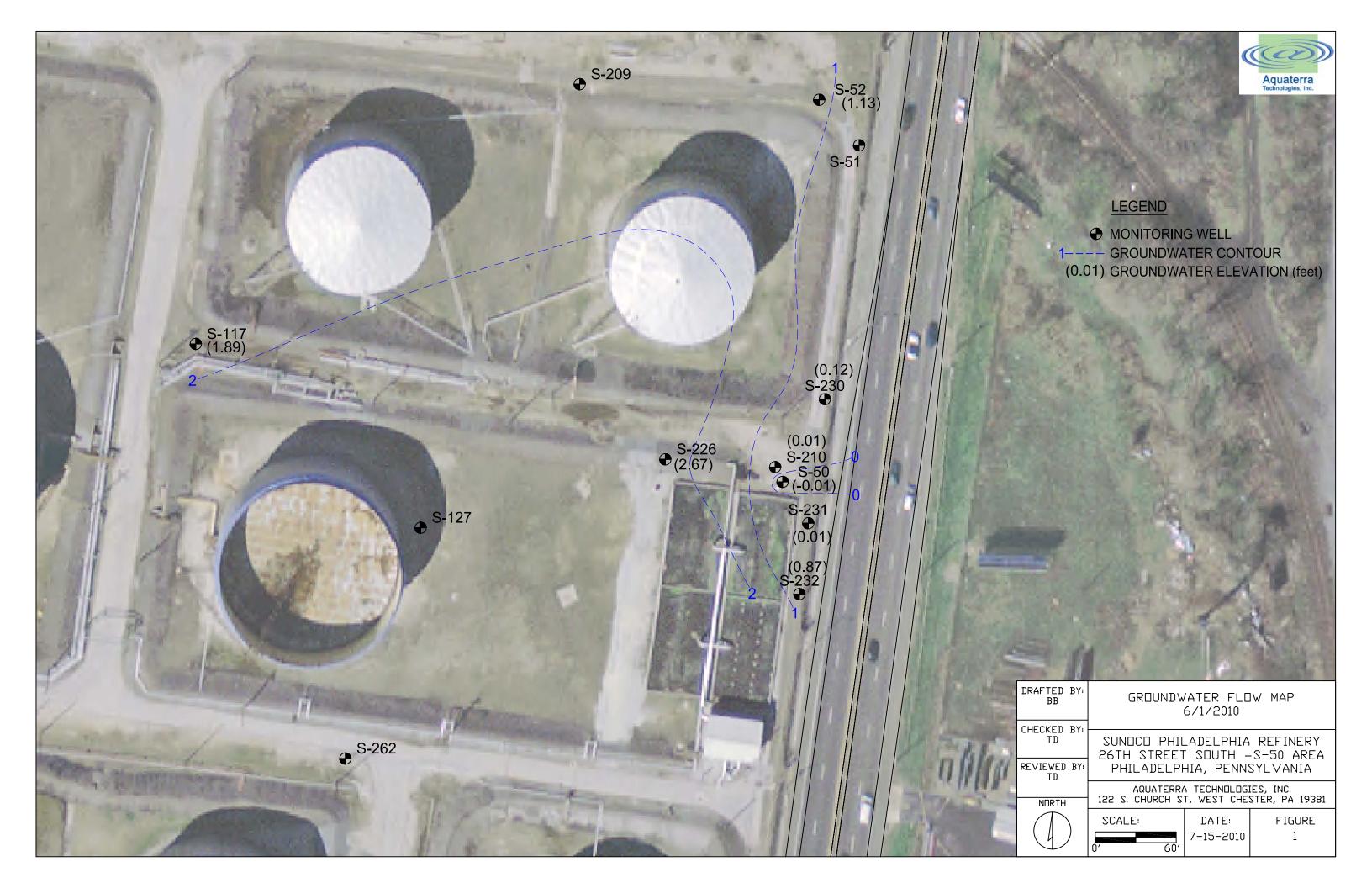
DO and ORP measurements are also collected during each O&M visit from injection points as well as nearby monitoring wells (S-50, S-210, S-226, S-230, S-231 and S-232). The pH, depth to water, and thickness of LNAPL, if present, is also recorded in monitoring wells proximal to the system (**Table 2**). As previously noted, S-226 had measurable SPH during the 1 June 2010 sampling event. During the O&M visits on 3 and 17 June 2010, SPH was recorded at thicknesses of 0.57 and 0.68 feet, respectively. A bailer was utilized to confirm these thicknesses as well.

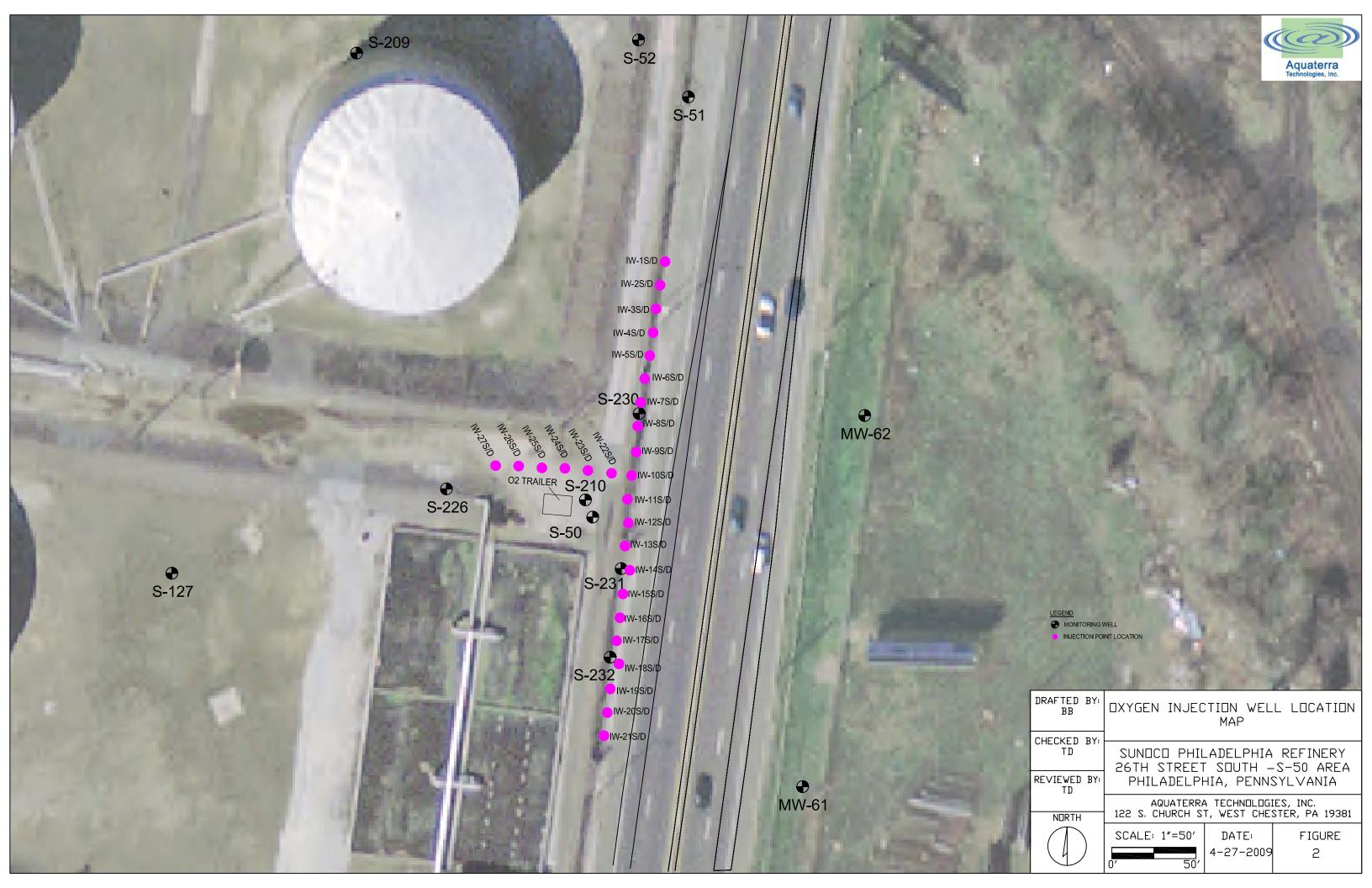
Due to the large number of injection points, half of the points are measured for DO and ORP concentrations during each by-weekly visit. DO data are presented in **Tables 3a and 3b** for the shallow and deep injection points, respectively. ORP data are presented in **Tables 4a and 4b** for the shallow and deep injection points, respectively. The DO data is also presented graphically for the shallow and deep wells. A 'goal line' of 2 milligrams per liter (mg/L) is presented on the graphs to illustrate where aerobic conditions exist. The 30 mg/L line is also illustrated on the graphs for each well as this is the goal concentration for wells in which oxygen is being injected. These graphs are included in **Attachment B**.

3.3 Injection Point Monitoring

In addition to the sampling activities summarized in Section 2.1, six groundwater monitoring wells proximal to the remediation system are sampled to aid in determining if aerobic conditions are maintained and if there is a reduction in the benzene concentrations and other COCs in the surficial aquifer. The select wells are sampled for natural attenuation parameters and microbial analyses. Generally when monitoring for these parameters, wells upgradient of the plume, within the plume and downgradient of the plume are monitored so that spatial analysis of the results can be performed. However, as the system provides a barrier along the downgradient property boundary, no downgradient wells are available for monitoring. Therefore, the following wells are sampled to provide information both within and outside of the plume, as defined by the high benzene concentrations. The wells include: S-50, S-52, S-117, S-226, S-231, and S-232. These wells were monitored and sampled on 1 June 2010 for the following parameters: DO, ORP, pH, conductivity, and temperature (all with field probe using flow-through cell); carbon dioxide (CO₂) using a field meter; alkalinity, ferrous iron, nitrate/nitrite, sulfate, total dissolved solids (TDS), total organic carbon (TOC), total inorganic carbon (TIC), biochemical oxygen demand (BOD), and hydrocarbon degrading bacteria including heterotrophic plate count via laboratory analyses. Note that some of these wells are already monitored for DO, ORP, and pH during the O&M visits.

Laboratory parameters from monitoring well samples are provided in **Table 1** and field parameters are provided in **Table 2**. Graphs were generated illustrating the natural log of benzene concentration, versus groundwater elevation and DO concentration in each of the six wells nearest the remediation system ($Attachment\ C$).







Well ID	Sample Date	Casing Elev (feet)	Total Depth	DTW	DTP	GW Elev	/ Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE	Isopropyl- benzene		1,2-Dibromo- ethane (EDB)	1,2-Dichloro- ethane (EDC)	Dissolved Lead	Fluorene	Phenan- threne	Chrysene	Pvrene	Sulfate	Nitrate Nitrogen	Nitrite Nitrogen	Organic carbon (total)	Inorganic Carbon (total)	Total Carbon	Alkalinity (pH 4.5)	Alkalinity (pH 8.3)	Dissolved solids (total)	Ferrous Iron	Biochemical oxgen Demand	HC Bacteria in Water	Hetero- trophic Plate Count
S-41	6/10/08	25.75	36	25.74	-	0.01	13	5	<1	3	43	NA 00	NA	NA 10.000	NA	NA 11.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA	NA	NA
	3/27/09 6/23/09			26.51 25.81	-	-0.76 -0.06	44 15	3	12 4	28 4	20 45	98 100	<5 <5	<0.030 <0.029	<1 <1	<1.0 <1.0	<5 <5	<5 <5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	9/16/09 12/9/09			25.37 24.76	-	0.38 0.99	37 12	11 5	<5 2	6 5	28 40	46 29	<5 <5	<0.029 <0.029	<5 <1	<1.0 <1.0	<5 <5	<5 <5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
S-42I	6/10/08	25.72	68	25.41	-	0.99	12	<1	<1	<1	<1	NA	NA	NA	NA NA	NA	NA	NA	NA	NA	NA	NA NA	NA NA	NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	3/27/09			26.11	-	-0.39	25	2	7	19	11	<2	<5	<0.032	3	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/23/09 9/16/09			25.41 24.98	-	0.31 0.74	6 78	<1 20	<1 2	2 10	14 <1	<2 <2	<5 <5	4 <0.029	4 <5	<1.0 <1.0	<5 <5	<5 <5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	12/9/09			24.43	-	1.29	29	<1	<1	<1	<1	<2	<5	<0.029	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NN	NA	NA
S-43	9/14/07 10/24/07	23.32		-	-	-	1,200 NA	69 NA	320 NA	220 NA	<10 NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	<0.50 NA	NA NA	8.6 NA	NA NA	NA NA	NA NA	NA NA	326 305	NA NA	16.8 NA	<100 NA	3,500 NA
	6/10/08		35	24.04	-	-0.72	930	46	180	130	6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/27/09 6/23/09			24.78 24.11	-	-1.46 -0.79	1,300 1,600	98 90	370 520	290 350	5 7	42 52	71 110	<0.030 <0.029	<2 <5	<1.0 <1.0	<5 <5	<5 <5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	9/16/09			23.71	-	-0.39	590	34	140	100	<5	26	32	<0.029	<5	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0.44	12/9/09	22.40	40	22.87	-	0.45	220	21	110	92	1	19	21	<0.029	<1 NA	<1.0	<5 NA	<5 NA	<5 NA	<5 NA	NA	NA	NA NA	NA 25.5	NA NA	NA NA	NA NA	NA	NA 454	NN	NA 24.4	NA 1100	NA 7.000
S-44	9/14/07 10/24/07	23.48	40	-	-	-	1,100 NA	24 NA	28 NA	58 NA	210 NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	<0.50 NA	NA NA	35.5 NA	NA NA	NA NA	NA NA	NA NA	454 381	NA NA	34.1 NA	<100 NA	7,800 NA
	6/10/08 3/27/09			25.64 26.25	-	-2.16 -2.77	1,000 620	23 22	16 25	33 65	260 310	NA 23	NA <5	NA <0.030	NA <1	NA <0.01	NA <5	NA 5	NA <5	NA <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	6/23/09			25.70	-	-2.22	1,300	27	18	37	290	37	<5 <5	<5	<5	<1.0	<5 <5	<5	<5 <5	<5 <5	NA	NA NA	NA NA	NA	NA	NA NA	NA NA	NA NA	NA	NA	NA	NA NA	NA NA
	9/16/09 12/9/09			25.33 22.43	-	-1.85 1.05	2,300 1,200	130 25	40 18	110 37	250 260	59 46	<5 <5	<0.030 <0.029	<10 <2	<1.0 <1.0	5 <5	5 <5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
S-45	6/11/08	21.57	24	22.92	-	-1.35	11	2	<1	<1	<1	NA	NA	NA	NA	NA NA	NA	NA	NA	NA NA	NA	NA NA	NA NA	NA	NA NA	NA NA	NA NA	NA NA	NA	NA	NA NA	NA NA	NA NA
	3/27/09			22.90	-	-1.33	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NS-Dry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/23/09 9/16/09			14.68 21.61	-	6.89 -0.04	NS-Dry 23	NS-Dry 2	NS-Dry 1	NS-Dry 2	NS-Dry <1	NS-Dry 10	NS-Dry <4	NS-Dry <1	NS-Dry <1	NS-Dry <1.0	NS-Dry <5	NS-Dry <5	NS-Dry <5	NS-Dry <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	12/9/09			22.87	-	-1.30	<1	<1	<1	<1	<1	<2	<5	<0.029	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
S-46	6/12/08 3/27/09	22.61	33	21.44 22.38	-	1.17 0.23	77 47	25 16	52 29	46 34	63 46	NA 160	NA 5	NA <0.030	NA <1	NA <1.0	NA <5	NA <5	NA <5	NA <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	6/23/09			21.82	-	0.79	51	16	30	32	56	180	<5	<0.029	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/16/09 12/9/09			21.13 20.98	-	1.48 1.63	33 28	10 9	10 12	17 11	27 27	56 66	<5 5	<0.029 <0.029	<1 <1	<1.0 <1.0	<5 <5	<5 <5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
S-47I	6/12/08	22.21	42	21.09	-	1.12	20	12	1	6	70	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/27/09 6/23/09			22.02 21.46	-	0.19 0.75	2 8	3 2	1 2	5 5	54 61	62 63	<5 <5	<0.029 <0.029	<1 <1	<1.0 <1.0	<5 <5	<5 <5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	9/16/09			20.78	-	1.43	18	2	3	8	53	40	<5	<0.030	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0.50	12/9/09	00.40		20.64	-	1.57	12	2	2	6	45	26	<5	<0.029	<1	<1.0	<5	<5	<5 NA	<5 NA	NA	NA NA	NA NA	NA	NA	NA	NA	NA	NA NA	NA	NA NA	NA	NA NA
S-50	6/12/08 3/23/09	22.48	29	22.06 23.08	-	0.42 -0.60	880 21,000	<50	17 230	91	2 <50	NA <100	NA 37	NA <0.030	NA <50	NA <30	NA <5	NA <5	NA <5	NA <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	5/7/09 6/23/09			22.62 22.33		-0.14 0.15	9,300 15,000	<20 21	120 170	41 63	<20 26	NA <40	NA 41	NA <0.029	NA <20	NA <1.0	NA <5	NA <5	NA <5	NA <5	10.7 5.7	<0.10 <0.10	0.067 0.095	18.6 20.8	NA NA	NA NA	297 321	<2.0 <2.0	423 451	40.9 59.7	16.5 23.5	<100 <100	NA 75
	7/21/09			22.62	-	-0.14	32,000	55	340	210	50	NA NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA	NA	NA	NA	NA NA	NA
	8/18/09 9/16/09			22.39 22.14	-	0.09 0.34	5,300 12,000	<10 <20	120 140	37 52	<10 28	NA <40	NA 33	NA <0.029	NA <20	NA <1.0	NA <5	NA <5	NA <5	NA <5	NA <5.0	NA <2.0	NA <1.0	NA 22.6	NA 149	NA 171	NA 378	NA <2.0	NA 472	NA 94.1	NA 21.9	NA <100	NA <10
	10/22/09			23.06	-	-0.58	8,200	<20	140	37	39	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/25/09 12/10/09			22.84 21.29	-	-0.36 1.19	9,500 12,000	<20 18	140 140	36 62	59 78	NA <20	NA 50	NA <0.029	NA <10	NA <1.0	NA <5	NA <5	NA <5	NA <5	NA <5.0	NA <0.10	NA 0.11	NA 26	NA 158	NA 184	NA 330	NA <2.0	NA 421	NA 114	NA 43.7	NA <1,000	NA 12,000
	3/17/10			22.40	-	0.08	580	6	18	25	3	6	6	NA	NA	NA	NA	NA	NA	NA	<5.0	<0.10	<0.050	20.3	91	111	404	<2.0	545	99.6	15.0	<100	120
S-52	6/1/10 6/11/08	23.54	40	22.49 23.27		-0.01 0.27	NA 12	NA <5	NA <5	NA <5	NA 1,300	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	<5.0 NA	<0.10 NA	0.078 NA	18.9 NA	160 NA	179 NA	378 NA	<2.0 NA	553 NA	102 NA	13.5 NA	<100 NA	1,300 NA
J-J2	3/25/09	20.04		23.90		-0.36	280	3	7	18	1,500	24	<5	<0.029	<1	<1.0	<5	<5	<5	<5	NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA	NA NA	NA	NA NA	NA NA	NA NA	NA NA
	5/7/09 6/22/09			23.52 23.12		0.02 0.42	NA 44	NA 2	NA <1	NA 2	NA 1,300	NA 23	NA <5	NA <0.029	NA <1	NA <1.0	NA <5	NA <5	NA <5	NA <5	<5.0 <5.0	<0.10 <0.10	<0.050 <0.050	24.3 24.1	NA NA	NA NA	337 338	<0.20 <2.0	426 430	13.8 24.7	12.5 13.5	<100 600	2,000 4,800
	9/16/09			22.76	-	0.78	51	3	<1	3	1,200	32	<5	<0.029	<1	<1.0	<5	<5	<5	<5	<5.0	<1.0	<0.5	25.9	133	159	343	<2.0	431	29.0	8.6	<100	65
	12/10/09 3/17/10			22.45 22.38	-	1.09 1.16	21 4	3 2	1 <1	3 2	1,100 930	33 18	<5 <4	<0.029 NA	<1 NA	<1.0 NA	<5 NA	<5 NA	<5 NA	<5 NA	<5.0 <5.0	<0.10 <0.10	<0.050 <0.050	28.8 24.5	137 115	166 139	343 356	<2.0 <2.0	414 455	31.8 28.9	11.7 13.7	100 <100	80 360
	6/1/10			22.41		1.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.9	<0.10	<0.050	25.8	131	157	362	<2.0	324	19.0	<5.9	<100	240
S-95	6/10/08 3/27/09	22.99	31	22.47 23.19	-	0.52 -0.20	<1 6	<1 2	<1 <1	1 5	2 3	NA 94	NA <5	NA <0.030	NA <1	NA <1.0	NA <5	NA <5	NA <5	NA <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	6/23/09			22.55	-	0.44	18	2	2	7	4	96	<5	<0.029	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/16/09 12/9/09			22.10 21.58		0.89 1.41	6 2	2 <1	<1 <1	4 2	3 2	100 32	<5 <5	<0.029 <0.030	<1 <1	<1.0 <1.0	<5 <5	<5 <5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
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Well ID	Sample Date	Casing Elev (feet)	Total Depth	DTW	DTP	GW Elev	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE	Isopropyl- benzene	Naph- thalene	1,2-Dibromo- ethane (EDB)	1,2-Dichloro- ethane (EDC)	Dissolved Lead	Fluorene	Phenan- threne	Chrysene	Pyrene	Sulfate	Nitrate Nitrogen	Nitrite Nitrogen	Organic carbon (total)	Inorganic Carbon (total)	Total Carbon	Alkalinity (pH 4.5)	Alkalinity (pH 8.3)	Dissolved solids (total)	Ferrous Iron	Biochemical oxgen Demand	HC Bacteria in Water	Hetero- trophic Plate Count
S-117	8/6/08	18.41	29	17.20	-	1.21	7,400	43	900	69	89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/25/09 5/7/09			18.12 17.58	-	0.29 0.83	250 NA	6 NA	<1 NA	16 NA	20 NA	12 NA	9 NA	<0.030 NA	<1 NA	<1.0 NA	<5 NA	<5 NA	<5 NA	<5 NA	NA 125	NA <0.10	NA 0.062	NA 6.4	NA NA	NA NA	NA 98.8	NA <2.0	NA 281	NA 25.3	NA 9.4	NA <1000	NA 78,000
	6/23/09			17.34	-	1.07	300	6	74	12	31	10	20	<0.029	<1	<1.0	<5	<5	<5	<5	65.6	<0.10	0.053	10.1	NA	NA	182	<2.0	305	33.6	7.1	<100	2,800
	9/16/09			16.88	-	1.53	370	<5	14	9	6	<10	<5	<0.029	<5	<1.0	<5	< 5	<5	<5	8.2	<1.0	<0.050	5.8	46.5	52.3	107	<2.0	128	17.9	7.8	<100	1,900
	12/10/09 3/17/10			16.29 16.87	-	2.12 1.54	47 120	2 8	49 89	3 8	2 16	12	14 26	<0.029 NA	<1 NA	<1.0 NA	<5 NA	<5 NA	<5 NA	<5 NA	32.3 62.0	<0.10 <0.10	<0.050 0.056	4 9.3	22.3 53.1	26.3 62.4	58.7 181	<2.0 <2.0	99 304	9.5 27.1	<5.7 12.6	<1,000 <100	16,000 230,000
	6/1/10			16.52	-	1.89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	177.0	<0.10	<0.050	22.7	127.3	150	290	<2.0	636	40.0	25.8	<10,000	780,000
S-118	6/11/08	17.90	30	17.60	-	0.30	770	28	170	100	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/27/09 6/23/09			18.34 17.72	-	-0.44 0.18	260 570	15 18	64 69	79 94	10 15	19 21	8 9	<0.030 <0.029	<1 <5	<1.0 <1.0	<5 <5	<5 <5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	9/16/09			17.72	_	0.18	84	5	74	29	1	13	11	<0.029	<1	<1.0	<5	<5	<5	<5	NA	NA NA	NA	NA	NA	NA	NA NA	NA NA	NA	NA	NA	NA NA	NA NA
	12/9/09			16.54	-	1.36	440	33	99	200	4	14	16	<0.029	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
S-127	6/11/08	17.10	32	16.43	-	0.67	2,100	93	360	220	820	NA 00	NA	NA -0.000	NA .10	NA 11.0	NA .5	NA .5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/27/09 6/23/09			17.28 16.55	-	-0.18 0.55	380 130	22 48	31 42	25 49	270 410	30 79	11 <50	<0.030 <0.029	<10 <1	<1.0 <1.0	<5 <50	<5 <50	<5 <50	<5 <50	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	9/16/09			16.10	-	1.00	1,700	30	110	67	300	48	32	<0.030	<5	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/09			15.91	-	1.19	890	76	320	210	660	61	62	<0.029	<2	<1	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
S-173	6/13/08 3/27/09	17.788	32 NS	16.52 -Pump in	- Well	1.27	94 NS	4 NS	3 NS	4 NS	100 NS	NA NS	NA NS	NA NS	NA NS	NA NS	NA NS	NA NS	NA NS	NA NS	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	6/23/09			-Pump in			NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA	NA	NA
S-208	6/12/08	20.86	30	19.33	-	1.53	17,000	900	2,100	6,100	1,300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/27/09 6/23/09			20.22 19.56	-	0.64 1.30	15,000 13,000	680 820	2,000 1,700	6,000 5,100	770 750	84 84	390 360	<0.031 <0.029	<10 <20	<1.0 <1.0	<5 <5	<5 <5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	9/16/09			19.03	-	1.83	15,000	780	1,700	4,800	1,100	150	350	<0.029	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA	NA	NA NA
	12/9/09			18.78	-	2.08	15,000	580	2,100	6,800	600	110	370	<0.030	<20	<1.0	<5	5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
S-209	6/11/08	26.90	39	26.33	-	0.57	8,400	<20	190	380	63	NA 00	NA .5	NA -0.000	NA :00	NA 11.0	NA .5	NA .5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/23/09 6/23/09			27.02 26.26	-	-0.12 0.64	5,400 6,700	21 22	<20 23	<20 37	77 78	63 74	<5 6	<0.030 <0.029	<20 <10	<1.0 <1.0	<5 6	<5 5	<5 <5	<5 <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	9/16/09			25.87	-	1.03	6,200	<20	170	290	46	66	28	<0.029	<20	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/09			25.64	-	1.26	6,800	21	140	220	67	87	19	<0.029	<10	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
S-210	6/12/08 3/23/09	23.69	40	23.78 24.49	-	-0.09 -0.80	34,000 28,000	5,800 140	470 530	1,400 620	190 130	NA <100	NA 120	NA <0.030	NA <50	NA <1.0	NA <5	NA <5	NA <5	NA <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	5/7/09			24.08	-	-0.39	30,000	120	630	1,000	140	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/23/09			23.71	-	-0.02	56,000	160	1,100	990	160	<200	160	<0.029	<100	<1.0	<5 NA	<5 NA	<5	<5 NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	7/21/09 8/18/09			23.79 23.65	-	-0.10 0.04	41,000 27,000	8,100 9,100	570 520	2,800 3,800	150 150	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	9/16/09			23.38	Sheen	0.31	48,000	17,000	640	3,200	<200	<400	520	<0.030	<200	<1.0	<47	<47	<47	<47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/22/09 11/25/09			24.36 24.07	24.24	-0.58 -0.38	NS 50,000	NS 390	NS 890	NS 1,100	NS 120	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	12/10/09			23.48	-	0.21	45,000	470	660	1,100	130	<100	320	<0.029	<50	<1.0	6	9	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA	NA	NA NA
	3/17/10			23.60	-	0.09	33,000	130	650	1,000	76	36	350	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
0.000	6/1/10	22.02	40	23.68	-	0.01	39,000	99	620	760	140	NA NA	NA	NA NA	NA NA	NA NA	NA	NA NA	NA	NA	NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA	NA NA	NA NA	NA NA	NA NA
S-226	6/11/08 3/23/09	22.02	40	21.83 22.51	-	0.19 -0.49	57,000 7,300	560 87	1,200 160	5,000 560	260 740	NA 25	NA 740	NA <0.030	NA <10	NA <1.0	NA <5	NA <5	NA <5	NA <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	5/7/09			22.20	-	-0.18	4,500	53	59	210	660	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5.0	<0.10	0.097	22.2	NA	NA	244	<2.0	335	38.3	19.4	<100	NA
	6/23/09 7/21/09			21.85 21.86	-	0.17 0.16	4,600 34,000	96 980	36 270	130 1,500	720 390	22 NA	11 NA	<0.029 NA	<10 NA	<1.0 NA	<5 NA	<5 NA	<5 NA	<5 NA	<5.0 NA	<0.10 NA	0.091 NA	21.9 NA	NA NA	NA NA	236 NA	<2.0 NA	325 NA	36.7 NA	13.3 NA	200 NA	1,600 NA
	8/18/09			21.73	-	0.10	29,000	1,100	76	760	230	NA NA	NA	NA	NA NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA	NA	NA
	9/16/09			21.43	-	0.59	4,700	90	77	340	630	28	22	<0.029	<10	<1.0	<5 NA	<5 NA	<5 NA	<5 NA	<5.0	<1.0	<0.50	23.9	96	120	248	<2.0	320	35.1	14.5	<100	7,600
	10/22/09 11/25/09			22.22 22.04	-	-0.20 -0.02	28,000 18,000	810 390	330 410	2,400 2,100	390 400	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	12/10/09			21.67	-	0.35	3,600	53	87	110	820	33	47	<0.029	<5	<1.0	<5	<5	<5	<5	<5.0	<0.10	0.092	25.5	106	131	288	<2.0	349	49.3	12.5	<100	45
	3/17/10 6/1/10			22.63 22.04	10 15	-0.61	6,700	110 NA	98 NA	280 NA	660 NA	22	<40	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	<5.0	<0.10	0.095	21.8	85 NA	107 NA	299 NA	<2.0	405 NA	44.0	18.8 NA	100	250 NA
S-230	9/14/07	20.19	32	- 22.04	18.45	2.67	NA 2,600	NA <5	32	NA 64	NA <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA <0.50	NA NA	NA 20.7	NA NA	NA NA	NA NA	NA NA	NA 406	NA NA	174	NA <1000	NA 30,000
2 200	10/24/07	20.10	32	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NA	NA	NA	413	NA	NA	NA	NA
	6/11/08 3/25/09			19.70 20.63	-	0.49 -0.44	990	<5 <20	17 51	34 52	<5 <20	NA <40	NA 14	NA <0.029	NA <20	NA <1.0	NA <5	NA <5	NA <5	NA <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	5/7/09			18.70	-	1.49	8,000 400	<1	2	5	<20 <1	NA	NA	NA	NA	<1.0 NA	NA	NA	NA	NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA	NA NA	NA NA
	6/23/09			18.65	-	1.54	1,200	6	23	23	<2	5	<50	<0.030	<2	<1.0	<50	<50	<50	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	7/21/09 8/18/09			19.78 19.65	-	0.41 0.54	1,900 1,000	120	12 11	41 15	<2 <2	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	9/16/09			18.81	-	1.38	340	2	8	10	<1	6	<50	<0.029	<1	<1.0	<50	<50	<50	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/22/09			20.39	-	-0.20	490 540	9	12 7	37 17	1	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	11/25/09 12/10/09			19.29 20.91	-	0.90 -0.72	540 620	8 4	7 16	16	<2 1	NA 3	NA <5	<0.029	NA <1	NA <1.0	NA <5	NA <5	NA <5	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
	3/17/10			16.57	-	3.62	230	2	8	11	<2	<2	<4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/1/10			20.07	-	0.12	610	3	19	17	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 1 Groundwater Gauging and Sampling Summary 26th Street South Area (AOI-1) Sunoco, Inc. Philadelphia Refinery



																IIIC. Fillia																	
																								Organic	Inorganic				Dissolved	1	Biochemical	HC	Hetero-
	Sample	Casing	Total	DTM	D.T.D.	OW 51		T. 1	Ethyl-	Total	METRE	Isopropyl-	Naph-	1,2-Dibromo-	1,2-Dichloro-	Dissolved		Phenan-	01		0.46-4-	Nitrate	Nitrite	carbon	Carbon	Total		Alkalinity	solids	Ferrous	oxgen	Bacteria	trophic Plate
Well ID	Date	Elev (feet)	Depth	DTW	DIP	GW Elev			benzene	Xylenes	MTBE	benzene	thalene	ethane (EDB)	ethane (EDC)	Lead	Fluorene	threne	Chrysene		_	Nitrogen	Nitrogen	(total)	(total)	Carbon	(pH 4.5)	(pH 8.3)	(total)	Iron	Demand	in Water	Count
S-231	9/14/07	19.94	28	-	-	-	8,000	270	120	690	<20	NA	NA	NA	NA NA	NA	NA	NA	NA	NA	NA	<0.50	NA	8.3	NA	NA	NA	NA	199	NA	19.5	<100	15,000
	10/24/07			-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	226	NA	NA	NA	NA
	6/12/08			20.18	-	-0.24	33,000	170	280	1,100	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/25/09			20.84	-	-0.90	60,000	<200	400	1,100	<200	<400	70	<0.030	<200	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/7/09			19.89	-	0.05	42,000	84	75	640	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5.0	<0.10	0.11	15.0	NA	NA	230	<2.0	634	65.9	48.6	<1000	NA
	6/22/09			19.22	-	0.72	28,000	<50	140	600	<50	<100	NA	<0.029	<50	<1.0	NA	NA	NA	NA	<5.0	<0.10	0.11	NA	NA	NA	269	<2.0	NA	NA	NA	6,000	200,000
	7/21/09			20.19	-	-0.25	31,000	67	190	750	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/18/09			20.02	-	-0.08	22,000	<50	150	560	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/16/09			19.66	-	0.28	3,900	11	24	170	<5	<10	16	<0.029	<5	<1.0	<5	<5	<5	<5	7.1	<0.10	<0.050	15.9	81.0	96.9	166	<2.0	388	38.2	12.7	<100	1,700
	10/22/09			20.47	-	-0.53	5,300	21	63	340	17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/25/09			20.28	-	-0.34	9,600	43	96	350	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/09			20.04	-	-0.10	12,000	50	75	300	17	<20	28	<0.029	<10	<1.0	<5	<5	<5	<5	<5.0	<0.10	0.099	32.5	141	173	258	<2.0	554	77.5	23.6	200	2,000
	3/17/10			19.84	-	0.10	12,000	<50	71	240	<50	<100	<200	NA	NA	NA	NA	NA	NA	NA	<5.0	<0.10	< 0.050	24.2	114	138	420	<2.0	828	137	31.8	<100	1,700
	6/1/10			19.93	-	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5.0	<0.10	0.10	25.0	183	208	376	<2.0	820	119	34.1	<100	3,000
S-232	9/14/07	20.31	32	_	T -	_	320	11	69	79	43	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	15.2	NA	NA	NA	NA	972	NA	12.2	<100	30,000
	10/24/07			_	_	_	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	798	NA	NA	NA	NA
	6/12/08			20.82	_	-0.51	180	6	41	58	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/25/09			21.55	_	-1.24	720	2	29	53	<1	6	9	<0.030	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/7/09			20.69	_	-0.38	360	2	5	31	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	39.1	<0.10	<0.050	11.8	NA	NA	285	<2.0	1120	0.69	<5.6	<100	11,000
	6/22/09			20.46	_	-0.15	13	<1	1	<1	2	<2	<5	<0.029	<1	<1.0	<5	<5	<5	<5	11.6	<0.10	<0.050	12.5	NA	NA	317	<2.0	872	7.4	<3.1	<100	3,700
	7/21/09			21.02	_	-0.71	140	21	11	22	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	8/18/09			20.89	_	-0.58	45	2	6	11	9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/16/09			19.55	_	0.76	170	1	4	14	<1	<2	<5	<0.029	<1	<1.0	<5	<5	<5	<5	<5.0	<0.10	<0.050	13.0	143	156	382	<2.0	848	1.6	5.4	<100	230
	10/22/09			20.58		-0.27	110	6	12	24	14	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA NA
	11/25/09			20.67		-0.36	140	3	4	8	2	NA	NA	NA NA	NA NA	NA	NA NA	NA	NA NA	NA	NA	NA	NA	NA NA	NA	NA	NA NA	NA	NA	NA	NA	NA	NA NA
	12/10/09			20.07		0.24	31	1	3	4	3	<2	<5	<0.029	<1	<1.0	<5	<5	<5	<5	86.8	1.4	<0.050	13.7	105	118	290	<2.0	846	0.34	<5.3	<100	2,100
	3/17/10			20.22		0.09	170	, ,	8	26	<1	<2	<4	NA	NA	NA	NA	NA	NA	NA	<5.0	0.46	<0.050	11.9	113	125	395	<2.0	992	0.27	<5.6	<100	2,400
	6/1/10			19.44		0.87	NA	NA NA	NA	NA	NA	NA	NA	NA NA	NA NA	NA	NA NA	NA NA	NA NA	NA	<5.0	<0.10	<0.050	11.6	167	179	425	<2.0	1,110	9.1	<4.4	<100	900
						1			INA				INA	INA		INA					\ 0.0	~ 0.10	\0.030	11.0	107				-	3.1		100	
S-255	6/10/08	21.91	38	22.88	-	-0.97	390	17	120	260	58	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	3/27/09			23.52	-	-1.61	67	7	120	130	4	11	18	<0.030	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	6/23/09			18.52	-	3.39	1	<1	3	17	<1	9	<5	<0.029	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/16/09			22.33	-	-0.42	47	10	24	37	<1	2	<5	<0.030	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/9/09			15.65	-	6.26	79	6	35	70	4	7	7	0.03	<1	<1.0	<5	<5	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
S-263	6/11/08	16.79	31	16.27	-	0.52	5,200	140	1,100	3,400	260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	3/27/09			17.10	-	-0.32	2,900	94	810	2,200	160	50	570	<0.030	<5	<1.0	140	390	<5	46	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	6/23/09			16.44	-	0.35	3,200	84	710	1,600	140	44	250	<0.029	<10	<1.0	32	80	<5	9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	9/16/09			15.95	_	0.84	2,600	110	920	2,000	120	57	310	<0.029	<5	<1.0	36	110	<5	11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/9/09			15.52	_	1.27	3,300	100	820	1,400	150	58	230	<0.029	<5	<1.0	16	31	<5	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		EP Act 2 SH	e Mec /=		1		5	1,000	700		20		100	0.05	5	5	1,900	1,100	1.9	130	+			-	-								
	PAD	EF ACT 2 SH	S NISC (N	on-res):			ס	1,000	/00	10,000	20	2,300	100	0.05	5	5	1,900	1,100	1.9	130		-				-	-	-	-	-	-		-

All laboratory data reported in micrograms per liter (µg/L) (equivalent to parts per billion).

DTW = depth to water (measured from top of inner casing)

DTP = depth to product if present (measured from top of inner casing)

Total Depth = Depth to bottom of well (measured from top of inner casing)

NS-Dry = Not Sampled. Dry can also mean issuficient volume of water to sample.

<# = Concentration less than the laboratory limit of quantitation (LOQ)</p>

PADEP Act 2 SHS MSC = Pennsylvania Department of Environmental Protection Act 2 Statewide Health Standard Medium Specific Concentrations based on used aquifer, non-residential, total dissolved solids ≤2,500.

Shaded cells indicate concentrations greater than the SHS MSC.

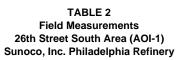
Through 2009: Select wells sampled on a monthly basis for BTEX & MTBE only (S-50, S-210, S-226, S-231, S-232). Select wells sampled on a quarterly basis for all parameters shown (S-50, S-52, S-117, S-226, S-231, S-232). Beginning in 2010: Eight wells (S-50, S-52, S-117, S-226, S-231, S-232) sampled on a quarterly basis; six for BTEX, MTBÉ and bio/chem parameters; two (S-210, S-230) for BTEX & MTBE only.



	Comple	Casing			Prod.					Conduc- tivity	CO ₂ (ppm)	
Well ID	Sample Date	Elev (feet)	DTW	DTP	Thickness	GW Elev	Temp (°C)	DO (mg/L)	ORP (mV)	,	(@10 sec.)	рН
S-50	3/23/2009	22.48	23.08	-	-	-0.60	NM	0.71	-69.4	NM	NM	7.63
	4/1/2009		NM	-	-	NM	NM	1.25	-49	NM	NM	NM
	4/15/2009		NM	-	-	NM	NM	3.05	-55	NM	NM	NM
	4/22/2009		NM	-	-	NM	NM	NM	-50	NM	NM	NM
	5/7/2009		22.62	-	-	-0.14	NM	1.58	-66	NM	512	6.3
	5/21/2009		NM	-	-	NM	NM	1.97	NM	NM	NM	NM
	6/4/2009		NM	-	-	NM	NM	0.85	-61	NM	NM	NM
	6/23/2009		22.33	-	-	0.15	NM	0.30	-116.7	0.920	280	6.52
	7/8/2009		22.49	-	-	-0.01	NM	0.70	-114	NM	NM	6.2
	7/21/2009		22.62	-	-	-0.14	NM	0.67	-128	NM	NM	6.3
	8/4/2009		22.78	-	-	-0.30	NM	1.03	-136	NM	NM	6.6
	8/19/2009		22.39	-	-	0.09	NM	0.70	-119	NM	NM	6.5
	9/9/2009		22.09	-	-	0.39	NM	1.01	-116	NM	NM	7.0
	9/16/2009		22.14	-	-	0.34	17.60	0.21	-146.4	1.016	452	6.75
	9/23/2009		22.03	-	-	0.45	NM	1.14	-112	NM	NM	6.6
	10/7/2009		22.75	-	-	-0.27	NM	1.07	-128	NM	NM	6.6
	10/22/2009		23.06	-	-	-0.58	NM	1.39	-109	NM	NM	6.6
	11/18/2009		22.98	-	-	-0.50	NM	1.45	-95	NM	NM	6.6
	11/25/2009		22.84	-	-	-0.36	NM	NM	NM	NM	NM	NM
	12/2/2009		22.90	-	-	-0.42	NM	1.05	-89	NM	NM	6.50
	12/10/2009		21.29	-	-	1.19	17.11	1.12	-96.5	0.909	515	6.76
	12/16/2009		22.94	-	-	-0.46	NM	1.00	-91.0	NM	NM	6.7
	12/30/2009		22.79	-	-	-0.31	NM	5.56	-79.0	NM	NM	6.7
	1/14/2010		22.78	-	-	-0.30	NM	1.32	-133	NM	NM	6.7
	1/28/2010		22.67	-	-	-0.19	NM	0.97	-131	NM	NM	6.7
	3/4/2010		22.60	-	-	-0.12	NM	2.02	-130	NM	NM	6.8
	3/17/2010		22.40	-	-	0.08	18.07	0.14	-134.7	1.039	406	6.9
	3/25/2010		22.33	-	-	0.15	NM	1.41	-122	NM	NM	7.0
	4/15/2010		22.19	-	-	0.29	NM	1.81	-117	NM	NM	6.8
	4/29/2010		22.30	-	-	0.18	NM	2.05	-134	NM	NM	6.9
	5/20/2010		22.47	-	-	0.01	NM	2.42	-130	NM	NM	7.2
	6/1/2010		22.49	-	-	-0.01	27.23	0.29	-159.3	1.068	304	7.0
	6/3/2010		22.52	-	-	-0.04	NM	2.25	-89	NM	NM	6.8
	6/17/2010		22.50	-	-	-0.02	NM	1.70	-100	NM	NM	6.9
S-52	3/25/2009	23.54	23.90	-	-	-0.36	NM	0.18	-94.3	NM	NM	NM
	5/7/2009		23.52	-	-	0.02	NM	NM	NM	NM	504	NM
	6/22/2009		23.12	-	-	0.42	NM	0.33	-116.2	0.873	336	6.62
	9/16/2009		22.76	-	-	0.78	15.96	0.33	-131.5	0.880	460	6.81
	12/10/2009		22.45	-	-	1.09	14.61	0.25	-135.9	0.878	312	6.89
	3/17/2010		22.38	-	-	1.16	15.15	0.65	-133.8	0.894	356	6.9
	6/1/2010		22.41		-	1.13	22.2	6.57	-84.6	0.977	294	7.07
S-117	3/25/2009	18.41	18.12	-	-	0.29	NM	0.25	-229.9	NM	NM	NM
	5/7/2009		17.58	-	-	0.83	NM	NM	NM	NM	9,999	NM
	6/23/2009		17.34	-	-	1.07	NM	0.25	-98.3	0.521	288	6.33
	9/16/2009		16.88	-	-	1.53	17.75	0.50	-101.2	0.236	319	6.57
	12/10/2009		16.29	-	-	2.12	13.48	0.28	-97.5	0.215	2,064	6.78
	3/17/2010		16.87	-	-	1.54	16.87	0.23	-112.6	0.552	3,783	6.53
	6/1/2010		16.52	-	-	1.89	18.97	1.70	-92.2	1.087	293	6.76
				1			<u>I</u>		<u> </u>			



	Sample	Casing			Prod.					Conduc- tivity	CO ₂ (ppm)	
Well ID	Date	Elev (feet)	DTW	DTP	Thickness	GW Elev	Temp (°C)	DO (mg/L)	ORP (mV)	(mS/cm)	(@10 sec.)	рН
S-210	3/23/2009	23.69	24.49	-	-	-0.80	NM	0.47	-48.8	NM	NM	7.17
	4/1/2009		NM	-	-	NM	NM	1.57	-88.0	NM	NM	NM
	4/15/2009		NM	-	-	NM	NM	4.02	-53.0	NM	NM	NM
	4/22/2009		NM	-	-	NM	NM	2.04	-64.0	NM	NM	NM
	5/7/2009		24.08	-	-	-0.39	NM	0.90	-46.00	NM	NM	NM
	5/21/2009		NM	-	-	NM	NM	0.83	NM	NM	NM	NM
	6/4/2009		NM	-	-	NM	NM	0.58	-72.00	NM	NM	NM
	6/23/2009		23.71	-	-	-0.02	NM	1.16	-82.0	NM	NM	NM
	7/8/2009		23.69	-	-	0.00	NM	0.95	-118.0	NM	NM	6.3
	7/21/2009		23.79	-	-	-0.10	NM	1.86	-89.0	NM	NM	6.1
	8/4/2009		23.82	23.79	0.03	-0.11	NM	NM	NM	NM	NM	NM
	8/19/2009		23.65	23.62	0.03	0.06	NM	NM	NM	NM	NM	NM
	9/9/2009		23.30	23.29	0.01	0.40	NM	NM	NM	NM	NM	NM
	9/16/2009		23.38	-	-	0.31	NM	NM	NM	NM	NM	NM
	9/23/2009		23.29	23.20	0.09	0.47	NM	NM	NM	NM	NM	NM
	10/7/2009		23.88	23.79	0.09	-0.12	NM	NM	NM	NM	NM	NM
	10/22/2009		24.36	24.24	0.12	-0.58	NM	NM	NM	NM	NM	NM
	11/25/2009		24.07	-	-	-0.38	NM	NM	NM	NM	NM	NM
	12/2/2009		24.11	-	-	-0.42	NM	1.54	-92	NM	NM	6.5
	12/10/2009		23.48	-	-	0.21	NM	NM	NM	NM	370	NM
	12/16/2009		24.11	-	-	-0.42	NM	1.63	-88	NM	NM	6.6
	12/30/2009		23.97	-	-	-0.28	NM	1.04	-76	NM	NM	6.6
	1/14/2010		23.90	-	-	-0.21	NM	1.55	-94	NM	NM	6.5
	1/28/2010		23.80	-	-	-0.11	NM	0.73	-119	NM	NM	6.7
	3/4/2010		23.78	-	-	-0.09	NM	1.55	-110	NM	NM	6.7
	3/17/2010		23.60	-	-	0.09	NM	NM	NM	NM	NM	NM
	3/25/2010		23.49	-	-	0.20	NM	1.78	-86	NM	NM	6.6
	4/15/2010		23.38	-	-	0.31	NM	1.81	-111	NM	NM	6.7
	4/29/2010		23.49	-	-	0.20	NM	2.19	-109	NM	NM	6.8
	5/20/2010		23.65	-	-	0.04	NM	2.34	-116	NM	NM	6.9
	6/1/2010		23.68	-	-	0.01	NM	NM	NM	NM	289	NM
	6/3/2010		23.68	-	-	0.01	NM	1.14	-106	NM	NM	6.8
	6/17/2010		23.71	-	-	-0.02	NM	1.89	-101	NM	NM	6.8





W-II ID	Sample	Casing	DTW	DTD	Prod.	OW Flan	T (°O)	DO (m m/l)	ODD (***)()	Conduc- tivity	CO ₂ (ppm)	-11
Well ID S-226	Date 3/23/2009	22.02	DTW 22.51	DTP -	Thickness	-0.49	Temp (°C)	DO (mg/L) 0.25	ORP (mV) -70.9	(mS/cm)	(@10 sec.)	pH NM
3-220	4/1/2009	22.02	_	_	-			7.00	-70.9 -20			
			NM	_	-	NM	NM	7.00 5.28	-20 -26	NM	NM	NM
	4/15/2009 4/22/2009		NM		-	NM	NM		-26 -56	NM	NM	NM
	5/7/2209		NM	-	-	NM 0.40	NM	0.88	-56 -73	NM	NM 0.000	NM 6.5
			22.20	-	-	-0.18	NM	0.32 1.80	_	NM	2,883	
	5/21/2009		NM		-	NM	NM		NM 4.4	NM	NM	NM
	6/4/2009 6/23/2009		NM	-	-	NM 0.47	NM	1.06	-14	NM 0.070	NM	NM C. CO
			21.85		-	0.17	NM	0.22	-99.3	0.670	282	6.63
	7/8/2009		21.80	-	-	0.22	NM	4.34	22	NM	NM	5.7
	7/21/2009		21.86	-	-	0.16	NM	2.13	-16	NM	NM	5.7
	8/4/2009		21.82	-	-	0.20	NM	4.12	-36.0	NM	NM	6.4
	8/19/2009		21.73	-	-	0.29	NM	0.48	-125	NM	NM	6.6
	9/9/2009		21.49	-	-	0.53	NM	3.63	120	NM	NM	5.7
	9/16/2009		21.43	-	-	0.59	16.43	0.25	-97.2	0.663	321	6.69
	9/23/2009		21.35	-	-	0.67	NM	2.25	-44	NM	NM	6.3
	10/7/2009		21.95	-	-	0.07	NM	2.47	-35	NM	NM	6.3
	10/22/2009		22.22	-	-	-0.20	NM	1.80	-58	NM	NM	6.4
	11/18/2009		22.11	-	-	-0.09	NM	1.27	-86	NM	NM	6.5
	11/25/2009		22.04	-	-	-0.02	NM	NM	NM	NM	NM	NM
	12/2/2009		22.14	-	-	-0.12	NM	1.78	-42	NM	NM	6.2
	12/10/2009		21.67	-	-	0.35	14.91	0.27	-117.9	0.75	573	6.76
	12/16/2009		22.12	-	-	-0.10	NM	2.37	21	NM	NM	6.2
	12/30/2009		21.96	-	-	0.06	NM	1.84	-20	NM	NM	6.3
	1/14/2010		21.90	-	-	0.12	NM	1.6	-18	NM	NM	6.1
	1/28/2010		21.84	-	-	0.18	NM	1.71	-47	NM	NM	6.3
	3/4/2010		21.77	-	-	0.25	NM	2.28	-59	NM	NM	6.5
	3/17/2010		22.63	-	-	-0.61	16.19	0.14	-112	0.76	432	6.8
	3/25/2010		21.51	-	-	0.51	NM	1.94	-74	NM	NM	6.5
	4/15/2010		21.35	-	-	0.67	NM	2.62	-82	NM	NM	6.6
	4/29/2010		21.51	-	-	0.51	NM	2.91	-83	NM	NM	6.9
	5/20/2010		21.60	-	-	0.42	NM	2.20	-115	NM	NM	7.1
	6/1/2010		22.04	18.45	3.59	2.67	NM	NM	NM	NM	284	NM
	6/3/2010		22.09	21.52	0.57	0.36	NM	NM	NM	NM	NM	NM
	6/17/2010		22.22	21.54	0.68	0.31	NM	NM	NM	NM	NM	NM



										Conduc-		
W. II IB	Sample	Casing	DTW	DTD	Prod.	OW 51	T (°O)	DO ((1)	ODD ()()	tivity	CO ₂ (ppm)	
Well ID S-230	Date 9/14/2007	20.19	DTW	DTP	Thickness	GW Elev	Temp (°C) 19.5	DO (mg/L) 0.87	ORP (mV) -113.00		(@ 10 sec.)	pH 7.0
5-230	3/25/2009	20.19	-			-0.44				NM	-	-
			20.63	-	-	-	NM	0.26	-105.9	NM	NM	NM
	4/1/2009		NM	-	-	NM	NM	1.58	-84	NM	NM	NM
	4/15/2009		NM	-	-	NM	NM	1.52	-69	NM	NM	NM
	4/22/2009		NM	-	-	NM	NM	1.78	-58	NM	NM	NM
	5/7/2209		18.70	-	-	1.49	NM	1.04	-79	NM	NM	NM
	5/21/2009		NM	-	-	NM	NM	1.21	NM	NM	NM	NM
	6/4/2009		NM	-	-	NM	NM	0.68	-71	NM	NM	NM
	6/23/2009		18.65	-	-	1.54	NM	0.64	-105	NM	NM	NM
	7/8/2009		19.62	-	-	0.57	NM	0.56	-126	NM	NM	6.4
	7/21/2009		19.78	-	-	0.41	NM	0.78	-51	NM	NM	5.9
	8/4/2009		19.29	-	-	0.90	NM	0.98	-111	NM	NM	6.7
	8/19/2009		19.65	-	-	0.54	NM	0.33	-142	NM	NM	6.9
	9/9/2009		19.32	-	-	0.87	NM	0.59	-125	NM	NM	6.7
	9/16/2009		18.81	-	-	1.38	NM	NM	NM	NM	NM	NM
	9/23/2009		19.09	-	-	1.10	NM	0.70	-106	NM	NM	6.7
	10/7/2009		20.36	-	-	-0.17	NM	0.92	-96	NM	NM	6.6
	10/22/2009		20.39	-	-	-0.20	NM	1.30	-97	NM	NM	6.7
	11/25/2009		19.29	-	-	0.90	NM	NM	NM	NM	NM	NM
	12/2/2009		20.92	-	-	-0.73	NM	2.07	-57	NM	NM	6.7
	12/10/2009		20.91	-	-	-0.72	NM	NM	NM	NM	319	NM
	12/16/2009		19.31	-	-	0.88	NM	5.00	0.6	NM	NM	7.0
	12/30/2009		18.89	-	-	1.30	NM	1.51	-32	NM	NM	6.9
	1/14/2010		20.27	-	-	-0.08	NM	2.62	-20	NM	NM	6.5
	1/28/2010		18.95	-	-	1.24	NM	3.55	-5	NM	NM	7.3
	3/4/2010		18.33	-	-	1.86	NM	3.03	-94	NM	NM	7.3
	3/17/2010		16.57	-	-	3.62	NM	NM	NM	NM	NM	NM
	3/25/2010		17.75	-	-	2.44	NM	3.74	16	NM	NM	6.9
	4/15/2010		19.02	-	-	1.17	NM	3.06	-99	NM	NM	7.1
	4/29/2010		17.97	-	-	2.22	NM	3.78	-66	NM	NM	7.2
	5/20/2010		17.97	-	-	2.22	NM	3.37	-67	NM	NM	7.7
	6/1/2010		20.07	-	-	0.12	NM	NM	NM	NM	296	NM
	6/3/2010		20.33	-	-	-0.14	NM	4.33	29	NM	NM	6.8
	6/17/2010		19.69	-	-	0.50	NM	3.36	-38	NM	NM	7.3



	Sample	Casing			Prod.					Conduc- tivity	CO ₂ (ppm)	
Well ID	Date	Elev (feet)	DTW	DTP	Thickness	GW Elev	Temp (°C)	DO (mg/L)	ORP (mV)	(mS/cm)	(@10 sec.)	рН
S-231	9/14/2007	19.94	-	-	-	-	20.30	0.65	-90.00	NM	2,958	6.8
	3/25/2009		20.84	-	-	-0.90	NM	0.30	-106.5	NM	NM	NM
	4/1/2009		NM	-	-	NM	NM	1.22	-82	NM	NM	NM
	4/15/2009		NM	-	-	NM	NM	1.40	-41	NM	NM	NM
	4/22/2009		NM	-	-	NM	NM	3.45	2.0	NM	NM	NM
	5/7/2009		19.89	-	-	0.05	NM	0.32	-23	NM	4,935	3.1
	5/21/2009		NM	-	-	NM	NM	2.12	NM	NM	NM	NM
	6/4/2009		NM	-	-	NM	NM	1.01	-75	NM	NM	NM
	6/22/2009		19.22	-	-	0.72	NM	0.35	-99.5	1.410	301	6.51
	7/8/2009		20.04	-	-	-0.10	NM	0.51	-104	NM	NM	6.2
	7/21/2009		20.19	-	-	-0.25	NM	0.75	-72	NM	NM	5.9
	8/4/2009		20.15	-	-	-0.21	NM	1.08	-82	NM	NM	6.4
	8/19/2009		20.02	-	-	-0.08	NM	0.91	-100	NM	NM	6.5
	9/9/2009		19.76	-	-	0.18	NM	1.20	-78	NM	NM	6.4
	9/16/2009		19.66	-	-	0.28	19.70	0.42	-94.9	0.870	3,636	6.53
	9/23/2009		19.62	-	-	0.32	NM	0.84	-39	NM	NM	6.2
	10/7/2009		20.12	-	-	-0.18	NM	1.40	-58	NM	NM	6.2
	10/22/2009		20.47	-	-	-0.53	NM	0.66	-41	NM	NM	6.1
	11/25/2009		20.28	-	-	-0.34	NM	NM	NM	NM	NM	NM
	12/2/2009		20.40	-	-	-0.46	NM	1.11	-82	NM	NM	6.4
	12/10/2009		20.04	-	-	-0.10	17.16	0.83	-100.3	1.289	2,181	6.46
	12/16/2009		20.55	-	-	-0.61	NM	2.66	-33	NM	NM	6.2
	12/30/2009		20.18	-	-	-0.24	NM	1.10	-69	NM	NM	6.4
	1/14/2010		20.11	-	-	-0.17	NM	1.81	-68	NM	NM	6.1
	1/28/2010		20.04	-	-	-0.10	NM	1.71	-69	NM	NM	6.4
	3/4/2010		20.02	-	-	-0.08	NM	2.01	-66	NM	NM	6.5
	3/17/2010		19.84	-	-	0.10	20.31	0.10	-140	1.689	660	6.7
	3/25/2010		19.85	-	-	0.09	NM	2.24	-72	NM	NM	6.7
	4/15/2010		19.60	-	-	0.34	NM	1.20	-72	NM	NM	6.3
	4/29/2010		19.76	-	-	0.18	NM	1.68	-36	NM	NM	6.5
	5/20/2010		19.91	-	-	0.03	NM	1.63	-67	NM	NM	6.6
	6/1/2010		19.93	-	-	0.01	21.73	0.18	-111.4	1.616	427	6.7
	6/3/2010		19.94	-	-	0.00	NM	1.81	-20	NM	NM	6.4
	6/17/2010		20.04	-	-	-0.10	NM	1.97	-30	NM	NM	6.4



Well ID Date Elev (feet) DTW DTP Thickness GW Elev Temp (*C) DO (mg/L) ORP (mV) (mS/cm) (@10 stress)			Conduc-										
S-232 9/14/2007 20.31 - - - - - NM		CO ₂ (ppm)	,										
3/25/2009		(@10 sec.)		<u> </u>		Temp (°C)	GW Elev	Thickness	DTP	DTW	· · · · · · ·		
4/1/2009 NM - - NM NM 27.30 23 NM NM 4/15/2009 NM - - NM NM 26.11 28 NM NM 5/7/2009 NM - - NM NM 13.85 147 NM NM 5/7/2009 20.69 - - -0.38 NM 11.09 284 NM 565 5/21/2009 NM - - NM NM 9.12 NM NM NM 6/4/2009 NM - - NM NM 19.90 43 NM NM 6/22/2009 20.46 - - -0.15 NM 6.25 31.5 1.781 27' 7/8/2009 21.01 - - -0.70 NM 31.02 3 NM NM 8/4/2009 20.80 - - -0.49 NM 22.51 -15 NM	NM	NM	NM			NM	-	-	-	-	20.31		S-232
4/15/2009 NM - - NM NM 26.11 28 NM NM 5/7/2009 20.69 - - -0.38 NM 11.09 284 NM 563 5/21/2009 NM - - NM NM 11.09 284 NM NM 563 5/21/2009 NM - - NM NM 19.90 43 NM 19.90 43 NM NM NM 19.90 19.90 19.90 <	NM	NM	NM			NM	-1.24	- '	-	21.55			
4/22/2009 NM - - NM NM 13.85 147 NM NM 5/7/2009 20.69 - - -0.38 NM 11.09 284 NM 563 5/21/2009 NM - - NM NM 9.12 NM NM NM 6/4/2009 NM - - NM NM 19.90 43 NM NM 6/22/2009 20.46 - - -0.15 NM 6.25 31.5 1.781 27' 7/8/2009 21.01 - - -0.70 NM 31.02 3 NM NM 8/4/2009 21.02 - - -0.71 NM 30.97 0.2 NM NM 8/4/2009 20.80 - - -0.49 NM 22.51 -15 NM NM 8/9/2009 20.84 - - -0.58 NM 21.02 29 N	NM	NM	NM			NM	NM	- '	-	NM			
5/7/2009 20.69 - - -0.38 NM 11.09 284 NM 566 5/21/2009 NM - - NM NM 9.12 NM	NM	NM	NM	28	26.11	NM	NM	-	-	NM		4/15/2009	
5/21/2009 NM - - NM NM 9.12 NM NM NM 6/4/2009 NM - - NM NM 19.90 43 NM NM 6/22/2009 20.46 - - -0.15 NM 6.25 31.5 1.781 27' 7/8/2009 21.01 - - -0.70 NM 31.02 3 NM NM 7/21/2009 21.02 - - -0.71 NM 30.97 0.2 NM NM 8/19/2009 20.80 - - -0.49 NM 22.51 -15 NM NM 8/19/2009 20.89 - - -0.58 NM 21.02 29 NM NM 9/9/2009 20.34 - - -0.58 NM 12.15 -12 NM NM 9/16/2009 19.55 - - 0.76 19.41 0.61 1.3	NM	NM	NM	147	13.85	NM	NM	-	-	NM		4/22/2009	
6/4/2009 NM - - NM NM 19.90 43 NM NM 6/22/2009 20.46 - - -0.15 NM 6.25 31.5 1.781 27' 7/8/2009 21.01 - - -0.70 NM 31.02 3 NM NM 8/4/2009 20.80 - - -0.71 NM 30.97 0.2 NM NM 8/19/2009 20.80 - - -0.49 NM 22.51 -15 NM NM 8/19/2009 20.89 - - -0.58 NM 21.02 29 NM NM 9/9/2009 20.34 - - -0.58 NM 21.02 29 NM NM 9/16/2009 19.55 - - 0.76 19.41 0.61 1.3 1.710 723 9/23/2009 20.23 - - 0.08 NM 17.10 0.0<	3.0	563	NM	284	11.09	NM	-0.38	-	-	20.69		5/7/2009	
6/22/2009 20.46 - - -0.15 NM 6.25 31.5 1.781 27' 7/8/2009 21.01 - - -0.70 NM 31.02 3 NM NM 8/4/2009 21.02 - - -0.71 NM 30.97 0.2 NM NM 8/19/2009 20.80 - - -0.49 NM 22.51 -15 NM NM 9/9/2009 20.89 - - -0.58 NM 21.02 29 NM NM 9/16/2009 19.55 - - -0.58 NM 21.02 29 NM NM 9/23/2009 20.34 - - -0.03 NM 12.15 -12 NM NM 9/23/2009 20.23 - - 0.08 NM 17.10 0.0 NM NM 10/7/2009 20.59 - - -0.28 NM 22.80 -20.0 NM NM 11/25/2009 20.67 - -0.36 NM <td>NM</td> <td>NM</td> <td>NM</td> <td>NM</td> <td>9.12</td> <td>NM</td> <td>NM</td> <td>-</td> <td>-</td> <td>NM</td> <td></td> <td>5/21/2009</td> <td></td>	NM	NM	NM	NM	9.12	NM	NM	-	-	NM		5/21/2009	
7/8/2009 21.01 - - -0.70 NM 31.02 3 NM NM 7/21/2009 21.02 - - -0.71 NM 30.97 0.2 NM NM 8/4/2009 20.80 - - -0.49 NM 22.51 -15 NM NM 8/19/2009 20.89 - - -0.58 NM 21.02 29 NM NM 9/9/2009 20.34 - - -0.58 NM 21.02 29 NM NM 9/16/2009 19.55 - - -0.03 NM 12.15 -12 NM NM 9/23/2009 19.55 - - 0.76 19.41 0.61 1.3 1.710 723 9/23/2009 20.23 - - 0.08 NM 17.10 0.0 NM NM 10/22/2009 20.58 - - -0.28 NM 22.80 <td< td=""><td>NM</td><td>NM</td><td>NM</td><td>43</td><td>19.90</td><td>NM</td><td>NM</td><td>-</td><td>-</td><td>NM</td><td></td><td>6/4/2009</td><td></td></td<>	NM	NM	NM	43	19.90	NM	NM	-	-	NM		6/4/2009	
7/21/2009 21.02 - - -0.71 NM 30.97 0.2 NM NM 8/4/2009 20.80 - - -0.49 NM 22.51 -15 NM NM 8/19/2009 20.89 - - -0.58 NM 21.02 29 NM NM 9/9/2009 20.34 - - -0.58 NM 21.02 29 NM NM 9/16/2009 20.34 - - -0.03 NM 12.15 -12 NM NM 9/23/2009 19.55 - - 0.76 19.41 0.61 1.3 1.710 723 9/23/2009 20.23 - - 0.08 NM 17.10 0.0 NM NM 10/7/2009 20.59 - - -0.28 NM 22.80 -20.0 NM NM 11/25/2009 20.58 - - -0.27 NM 13.96 -24.0 NM NM 12/10/2009 20.99 - - -0.	6.38	271	1.781	31.5	6.25	NM	-0.15	- '	-	20.46		6/22/2009	
8/4/2009 20.80 - - -0.49 NM 22.51 -15 NM NM 8/19/2009 20.89 - - -0.58 NM 21.02 29 NM NM 9/9/2009 20.34 - - -0.03 NM 12.15 -12 NM NM 9/16/2009 19.55 - - 0.76 19.41 0.61 1.3 1.710 723 9/23/2009 20.23 - - 0.08 NM 17.10 0.0 NM NM 10/7/2009 20.59 - - -0.28 NM 22.80 -20.0 NM NM 10/22/2009 20.58 - - -0.27 NM 13.96 -24.0 NM NM 12/2/2009 20.67 - - -0.36 NM NM NM NM NM 12/10/2009 20.99 - - -0.68 NM 28.17 -41 NM NM 12/16/2009 20.87 - - -0.56	6.8	NM	NM	3	31.02	NM	-0.70	- '	-	21.01		7/8/2009	
8/19/2009 20.89 - - -0.58 NM 21.02 29 NM NM 9/9/2009 20.34 - - -0.03 NM 12.15 -12 NM NM 9/16/2009 19.55 - - 0.76 19.41 0.61 1.3 1.710 723 9/23/2009 20.23 - - 0.08 NM 17.10 0.0 NM NM 10/7/2009 20.59 - - -0.28 NM 22.80 -20.0 NM NM 10/22/2009 20.58 - - -0.27 NM 13.96 -24.0 NM NM 11/25/2009 20.67 - - -0.36 NM NM NM NM NM 12/10/2009 20.99 - - -0.68 NM 28.17 -41 NM NM 12/16/2009 20.87 - - -0.56 NM 29.42 5 NM NM 12/30/2009 20.72 - - - <td>6.4</td> <td>NM</td> <td>NM</td> <td>0.2</td> <td>30.97</td> <td>NM</td> <td>-0.71</td> <td>- '</td> <td>-</td> <td>21.02</td> <td></td> <td>7/21/2009</td> <td></td>	6.4	NM	NM	0.2	30.97	NM	-0.71	- '	-	21.02		7/21/2009	
9/9/2009 20.34 - - -0.03 NM 12.15 -12 NM NM 9/16/2009 19.55 - - 0.76 19.41 0.61 1.3 1.710 723 9/23/2009 20.23 - - 0.08 NM 17.10 0.0 NM NM 10/7/2009 20.59 - - -0.28 NM 22.80 -20.0 NM NM 10/22/2009 20.58 - - -0.27 NM 13.96 -24.0 NM NM 11/25/2009 20.67 - - -0.36 NM NM NM NM NM 12/10/2009 20.99 - - -0.68 NM 28.17 -41 NM NM 12/16/2009 20.87 - - -0.56 NM 29.42 5 NM NM 12/30/2009 20.72 - - -0.41 NM 23.33 -35 NM NM 1/14/2010 24.84 - - -4.	6.5	NM	NM	-15	22.51	NM	-0.49	- '	-	20.80		8/4/2009	
9/16/2009	6.6	NM	NM	29	21.02	NM	-0.58	-	-	20.89		8/19/2009	
9/23/2009	6.5	NM	NM	-12	12.15	NM	-0.03	-	-	20.34		9/9/2009	
10/7/2009 20.59 - - -0.28 NM 22.80 -20.0 NM NM 10/22/2009 20.58 - - -0.27 NM 13.96 -24.0 NM NM 11/25/2009 20.67 - - -0.36 NM NM NM NM NM NM 12/2/2009 20.99 - - -0.68 NM 28.17 -41 NM NM 12/10/2009 20.07 - - 0.24 18.35 26.58 56.70 1.667 368 12/16/2009 20.87 - - -0.56 NM 29.42 5 NM NM 12/30/2009 20.72 - - -0.41 NM 23.33 -35 NM NM 1/14/2010 24.84 - - -4.53 NM 22.85 95 NM NM	6.55	723	1.710	1.3	0.61	19.41	0.76	-	-	19.55		9/16/2009	
10/22/2009 20.58 - - -0.27 NM 13.96 -24.0 NM NM <td< td=""><td>6.6</td><td>NM</td><td>NM</td><td>0.0</td><td>17.10</td><td>NM</td><td>0.08</td><td>-</td><td>-</td><td>20.23</td><td></td><td>9/23/2009</td><td></td></td<>	6.6	NM	NM	0.0	17.10	NM	0.08	-	-	20.23		9/23/2009	
11/25/2009 20.67 - - -0.36 NM NM <td>6.6</td> <td>NM</td> <td>NM</td> <td>-20.0</td> <td>22.80</td> <td>NM</td> <td>-0.28</td> <td>-</td> <td>-</td> <td>20.59</td> <td></td> <td>10/7/2009</td> <td></td>	6.6	NM	NM	-20.0	22.80	NM	-0.28	-	-	20.59		10/7/2009	
12/2/2009 20.99 - - -0.68 NM 28.17 -41 NM NM 12/10/2009 20.07 - - 0.24 18.35 26.58 56.70 1.667 369 12/16/2009 20.87 - - -0.56 NM 29.42 5 NM NM 12/30/2009 20.72 - - -0.41 NM 23.33 -35 NM NM 1/14/2010 24.84 - - -4.53 NM 22.85 95 NM NM	6.5	NM	NM	-24.0	13.96	NM	-0.27	-	-	20.58		10/22/2009	
12/10/2009 20.07 - - 0.24 18.35 26.58 56.70 1.667 369 12/16/2009 20.87 - - -0.56 NM 29.42 5 NM NM 12/30/2009 20.72 - - -0.41 NM 23.33 -35 NM NM 1/14/2010 24.84 - - -4.53 NM 22.85 95 NM NM	NM	NM	NM	NM	NM	NM	-0.36	-	-	20.67		11/25/2009	
12/16/2009 20.87 - - -0.56 NM 29.42 5 NM NM 12/30/2009 20.72 - - -0.41 NM 23.33 -35 NM NM 1/14/2010 24.84 - - -4.53 NM 22.85 95 NM NM	6.9	NM	NM	-41	28.17	NM	-0.68	-	-	20.99		12/2/2009	
12/30/2009 20.720.41 NM 23.33 -35 NM NM 1/14/2010 24.844.53 NM 22.85 95 NM NM	6.80	369	1.667	56.70	26.58	18.35	0.24	-	-	20.07		12/10/2009	
1/14/2010 24.844.53 NM 22.85 95 NM NM	6.8	NM	NM	5	29.42	NM	-0.56	-	-	20.87		12/16/2009	
	6.7	NM	NM	-35	23.33	NM	-0.41	-	-	20.72		12/30/2009	
1/28/2010 20.610.30 NM 29.63 14 NM NM	6.4	NM	NM	95	22.85	NM	-4.53	-	-	24.84		1/14/2010	
	6.9	NM	NM	14	29.63	NM	-0.30	-	-	20.61		1/28/2010	
3/4/2010 20.600.29 NM 22.91 9 NM NM	6.8	NM	NM	9	22.91	NM	-0.29	-	-	20.60		3/4/2010	
3/17/2010 20.22 0.09 20.54 1.65 34 1.92 2,39	6.6	2,397	1.92	34	1.65	20.54	0.09	-	-	20.22		3/17/2010	
3/25/2010 20.25 0.06 NM 2.49 22 NM NM	6.7	NM	NM	22	2.49	NM	0.06	-	-	20.25		3/25/2010	
4/15/2010 20.11 0.20 NM 2.81 -4 NM NM	6.7	NM	NM	-4	2.81	NM	0.20	- '	-	20.11		4/15/2010	
	6.7	NM	NM	-29		NM	0.06	- '	-	20.25		4/29/2010	
5/20/2010 20.480.17 NM 2.84 -20 NM NM	6.9	NM	NM	-20	2.84	NM	-0.17	- '	-	20.48		5/20/2010	
	6.8	368	2.116	-37.8		22.22	0.87	- '	-	19.44		6/1/2010	
	6.6	NM	NM			NM	-0.20	- '	-	20.51		6/3/2010	
	6.8	NM	NM	30		NM	-0.40	- '	_	20.71		6/17/2010	

DTW = depth to water (measured from top of inner casing)

DTP = depth to product if present (measured from top of inner casing)

Total Depth = Depth to bottom of well (measured from top of inner casing)

Some measurements collected on a monthly basis as part of performance monitoring and some on a quarterly basis as part of quarterly sampling program.

Note: If Readings from O&M and GW sampling occurred on same day (or within a day), the GW Sampling reading was tabulated.

Note that DO during GW sampling is consistently lower than 'grab' samples done during O&M.

System shut down on 11-13-09 due to paving activities; restarted on 11-18-09. (switched injection to shallow points except deep injection at IP-17, 18 & 19. Could not read 17th Street points on 11/25/09 due to continued paving in roadway.

During February visits could not check wells due to amount of snow.





SUNOCO-PHILADELPHIA REFINERY, 26TH STREET (AOI-1) SUMMARY OF OXYGEN INJECTION REMEDIATION SYSTEM <u>DO</u> FIELD DATA <u>SHALLOW WELLS ONLY</u>

DATE	IW-1S	IW-2S	IW-3S	IW-4S	IW-5S	IW-6S	IW-7S	IW-8S	IW-9S	IW-10S	IW-11S	IW-12S	IW-13S	IW-14S	IW-15S	IW-16S	IW-17S	IW-18S	IW-19S	IW-20S	IW-21S	IW-22S	IW-23S	IW-24S	IW-25S	IW-26S	IW-27S
25-Mar-09	4.36	3.89	3.16	2.79	1.86	1.82	1.31	1.79	1.87	1.92	1.14	1.47	1.79	1.05	0.22	1.33	0.25	0.23	0.22	2.13	0.16	0.18	0.26	0.43	1.53	0.22	0.29
8-Apr-09	7.20	16.01	3.83	14.01	3.13	13.06	5.27	7.28	20.70	22.72	9.54	25.11	3.36	29.35	4.05	29.26	21.86	38.92	26.06	34.60	5.20	23.00	12.31	3.31	22.87	28.10	2.74
15-Apr-09	4.92	27.80	NM-I	25.37	4.98	25.11	4.09	22.85	33.58	5.38	3.31	32.20	3.50	33.33	3.36	NM											
22-Apr-09	NM	NM	NM	NM	NM	NM	30.51	33.04	30.53	33.55	22.48	25.58	47.03	53.05	4.02	49.87	32.17	3.85									
06-May-09	35.15	NM	3.21	NM	3.05	NM	2.15	NM	39.31	NM	13.28	NM	5.30	NM	3.23	NM	36.66	NM	37.73	NM	10.44	NM	37.92	NM	39.58	NM	3.97
21-May-09	NM	5.72	NM	28.50	NM	35.16	NM	36.28	NM	16.52	NM	36.96	NM	39.07	NM	37.80	NM	36.44	NM	37.20	NM	38.44	NM	4.55	NM	36.11	NM
04-Jun-09	31.45	NM	3.10	NM	2.28	NM	2.17	NM	37.82	NM	1.82	NM	15.82	NM	2.45	NM	26.71	NM	33.80	NM	15.64	NM	27.38	NM	27.27	NM	2.61
23-Jun-09	NM	17.66	NM	19.85	NM	15.39	NM	17.36	NM	7.01	NM	24.88	NM	26.16	NM	26.26	NM	26.85	NM	15.84	NM	29.20	NM	2.66	NM	20.35	NM
08-Jul-09	34.40	NM	2.29	NM	2.68	NM	3.56	NM	32.86	NM	3.19	NM	36.09	NM	2.78	NM	33.70	NM	32.20	NM	18.92	NM	36.01	NM	34.93	NM	32.52
21-Jul-09	NM	17.40	NM	34.70	NM	34.84	NM	30.71	NM	17.53	NM	36.34	NM	33.27	NM	31.70	NM	31.08	NM	31.78	NM	35.03	NM	3.30	NM	31.88	NM
04-Aug-09	6.00	NM	35.25	NM	2.65	NM	3.98	NM	34.53	NM	2.55	NM	34.88	NM	2.19	NM	30.75	NM	30.18	NM	3.79	NM	34.71	NM	32.41	NM	31.32
19-Aug-09	NM	15.09	NM	37.85	NM	42.38	NM	25.54	NM	19.52	NM	14.10	NM	10.79	NM	19.51	NM	18.37	NM	31.71	NM	32.96	NM	14.95	NM	36.20	NM
09-Sep-09	35.96	NM	2.91	NM	3.29	NM	6.62	NM	33.46	NM	2.75	NM	34.35	NM	4.70	NM	25.81	NM	28.01	NM	25.20	NM	34.04	NM	15.45	NM	27.52
23-Sep-09	NM	19.22	NM	33.26	NM	34.42	NM	32.01	NM	20.61	NM	35.33	NM	33.13	NM	35.51	NM	31.82	NM	34.40	NM	29.11	NM		NM	36.01	NM
7-Oct-09	36.22	NM	2.45	NM	3.99	NM	9.16	NM	30.88	NM	2.88	NM	32.76	NM	2.74	NM	31.10	NM	27.40	NM	28.48	NM	29.63	NM	38.48	NM	36.66
21-Oct-09	NM	25.01	NM	35.52	NM	32.69	NM	31.98	NM	22.04	NM	30.39	NM	32.23	NM	31.87	NM	30.65	NM	28.18	NM	33.27	NM	4.11	NM	34.18	NM
18-Nov-09	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	26.08	27.40	25.77	24.55	30.33	30.04									
2-Dec-09	29.94	NM	35.28	NM	34.80	NM	26.95	NM	33.11	NM	17.10	NM	25.85	NM	31.51	NM	33.16	NM	31.08	NM	25.86	NM	30.80	NM	19.71	NM	17.56
16-Dec-09	NM	35.58	NM	20.27	NM	27.61	NM	23.17	NM	29.90	NM	6.36	NM	34.37	NM	33.99	NM	36.55	NM	32.80	NM	29.80	NM	30.90	NM	31.49	NM
30-Dec-09	36.39	NM	36.95	NM	35.10	NM	28.08	NM	28.21	NM	7.43	NM	26.76	NM	29.37	NM	30.42	NM	33.96	NM	27.63	NM	34.00	NM	10.13	NM	35.23
14-Jan-10	NM	30.84	NM	33.33	NM	25.93	NM	22.00	NM	28.87	NM	24.38	NM	27.80	NM	25.96	NM	28.52	NM	26.19	NM	22.70	NM	22.94	NM	18.27	NM
28-Jan-10	36.39	NM	36.14	NM	31.92	NM	24.88	NM	28.86	NM	3.85	NM	25.56	NM	30.07	NM	32.33	NM	30.57	NM	24.21	NM	33.58	NM	32.97	NM	32.73
4-Mar-10	36.87	NM	42.25	NM	39.58	NM	20.84	NM	31.50	NM	5.46	NM	26.06	NM	30.77	NM	33.16	NM	32.19	NM	19.38	NM	33.53	NM	37.81	NM	34.69
25-Mar-10	NM	29.48	NM	25.73	NM	28.75	NM	25.08	NM	32.64	NM	7.05	NM	32.62	NM	31.78	NM	33.23	NM	31.38	NM	21.14	NM	27.63	NM	33.64	NM
15-Apr-10	34.83	NM	35.04	NM	36.13	NM	18.88	NM	28.83	NM	5.18	NM	25.65	NM	29.42	NM	32.08	NM	29.33	NM	22.57	NM	34.50	NM	32.86	NM	30.30
29-Apr-10	NM	31.49	NM	31.25	NM	37.24	NM	28.91	NM	35.93	NM	5.14	NM	33.98	NM	30.06	NM	32.64	NM	29.36	NM	29.08	NM	29.91	NM	33.95	NM
20-May-10	30.70	NM	34.42	NM	35.40	NM	14.41	NM	27.67	NM	5.85	NM	24.98	NM	24.56	NM	34.76	NM	32.28	NM	26.19	NM	30.64	NM	34.11	NM	28.66
3-Jun-10	NM	30.24	NM	32.34	NM	35.26	NM	27.27	NM	32.38	NM	4.24	NM	8.91	NM	26.94	NM	32.44	NM	27.60	NM	23.73	NM	28.09	NM	32.71	NM
17-Jun-10	32.86	NM	34.43	NM	34.96	NM	39.16	NM	28.41	NM	6.73	NM	21.67	NM	29.58	NM	33.56	NM	29.69	NM	28.41	NM	29.78	NM	34.66	NM	28.44
1. 00 10	02.00		JJ		000		555				00						55.55		_0.00						333		

^{*}All DO data is in (mg/L)

Note: During O&M visits, DO readings were not taken from all wells due to time contraints (54 inj points). Therefore, half of the readings were taken per visit. Initially they were read in order, however it was decided to read every other point each time so that each visits data covered the whole area on 15 April 2009, IW-3S was under water, therefore, no DO reading was collected.

Upon restart, switched injection to shallow points except deep injection at IP-17, 18 & 19.

^{*}System off on 11-13-09 due to paving along 17th street. System restarted on 11-18-09 (finishing paving - could only read inj points along side street).

TABLE 3b



SUNOCO-PHILADELPHIA REFINERY, 26TH STREET (AOI-1) SUMMARY OF OXYGEN INJECTION REMEDIATION SYSTEM \underline{DO} FIELD DATA $\underline{DEEP\ WELLS\ ONLY}$

																											-
DATE	IW-1D	IW-2D	IW-3D	IW-4D	IW-5D	IW-6D	IW-7D	IW-8D	IW-9D	IW-10D	IW-11D	IW-12D	IW-13D	IW-14D	IW-15D	IW-16D	IW-17D	IW-18D	IW-19D	IW-20D	IW-21D	IW-22D	IW-23D	IW-24D	IW-25D	IW-26D	IW-27D
25-Mar-09	7.04	2.13	2.28	2.77	1.93	2.07	0.38	1.89	1.45	2.01	1.66	1.6	1.68	2.31	0.25	1.44	0.99	0.22	1.43	1.94	1.51	0.2	0.25	1.72	NM	0.2	1.37
08-Apr-09	12.56	13.02	14.23	2.77	13.94	13.65	15.48	26.26	18.66	31.27	29.02	18.20	12.48	18.94	35.51	30.10	14.98	19.89	19.90	15.50	20.20	6.88	22.91	16.08	30.94	10.57	14.87
15-Apr-09	15.52	30.24	NM-I	2.79	35.98	33.70	33.62	30.46	32.95	37.01	32.73	32.65	13.01	34.17	36.50	NM											
22-Apr-09	NM	NM	NM	NM	NM	NM	30.70	13.76	15.55	28.10	19.52	41.07	12.10	54.80	48.13	47.11	13.65	49.40									
06-May-09	12.73	NM	27.80	NM	37.48	NM	33.88	NM	37.94	NM	41.28	NM	17.77	NM	38.12	NM	21.37	NM	34.62	NM	31.42	NM	34.88	NM	42.54	NM	34.15
21-May-09	NM	39.77	NM	3.23	NM	40.11	NM	37.81	NM	39.50	NM	36.11	NM	34.80	NM	27.56	NM	27.47	NM	26.32	NM	26.77	NM	39.30	NM	13.33	NM
04-Jun-09	5.40	NM	33.77	NM	32.94	NM	31.78	NM	31.01	NM	37.32	NM	28.55	NM	29.82	NM	16.85	NM	29.60	NM	28.65	NM	26.73	NM	30.75	NM	26.23
23-Jun-09	NM	25.50	NM	2.84	NM	21.25	NM	25.66	NM	26.51	NM	21.54	NM	19.74	NM	29.71	NM	13.85	NM	11.86	NM	16.91	NM	22.56	NM	16.25	NM
08-Jul-09	12.74	NM	39.12	NM	33.94	NM	36.58	NM	34.91	NM	41.18	NM	34.88	NM	37.54	NM	32.78	NM	34.12	NM	30.98	NM	32.68	NM	39.62	NM	34.55
21-Jul-09	NM	37.54	NM	4.29	NM	40.77	NM	36.37	NM	42.90	NM	37.60	NM	35.80	NM	38.77	NM	27.27	NM	31.50	NM	33.10	NM	36.91	NM	32.55	NM
04-Aug-09	34.08	NM	1.64	NM	39.06	NM	34.53	NM	37.98	NM	41.07	NM	31.55	NM	33.21	NM	24.30	NM	36.36	NM	33.34	NM	30.80	NM	42.22	NM	37.15
19-Aug-09	NM	40.53	NM	2.50	NM	42.12	NM	40.80	NM	44.36	NM	17.30	NM	6.49	NM	10.20	NM	19.24	NM	41.83	NM	26.00	NM	46.01	NM	18.29	NM
09-Sep-09	5.30	NM	38.38	NM	33.68	NM	35.64	NM	33.32	NM	35.77	NM	31.87	NM	35.35	NM	29.70	NM	31.75	NM	33.11	NM	33.26	NM	38.00	NM	33.80
23-Sep-09	NM	37.40	NM	2.90	NM	33.92	NM	34.57	NM	35.58	NM	34.34	NM	33.50	NM	33.96	NM	31.67	NM	27.31	NM	26.61	NM	38.13	NM	23.25	NM
7-Oct-09	5.25	NM	38.12	NM	39.72	NM	36.71	NM	36.82	NM	34.62	NM	33.44	NM	35.01	NM	30.03	NM	33.61	NM	30.66	NM	28.75	NM	38.06	NM	36.42
21-Oct-09	NM	36.16	NM	2.96	NM	35.50	NM	35.63	NM	35.89	NM	36.17	NM	35.23	NM	32.60	NM	30.18	NM	30.66	NM	17.38	NM	37.22	NM	18.17	NM
18-Nov-09	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	15.71	27.72	33.91	35.67	16.02	31.73									
2-Dec-09	29.75	NM	29.51	NM	25.88	NM	37.00	NM	29.18	NM	30.96	NM	27.51	NM	31.03	NM	31.11	NM	32.72	NM	24.02	NM	24.01	NM	33.56	NM	30.58
16-Dec-09	NM	21.56	NM	41.41	NM	22.92	NM	24.44	NM	37.15	NM	19.29	NM	21.75	NM	16.73	NM	36.29	NM	19.50	NM	7.00	NM	31.72	NM	7.85	NM
30-Dec-09	16.78	NM	26.99	NM	22.91	NM	36.31	NM	23.07	NM	26.77	NM	22.11	NM	28.73	NM	33.70	NM	36.53	NM	15.08	NM	20.71	NM	25.54	NM	28.33
14-Jan-10	NM	11.81	NM	24.54	NM	22.02	NM	16.77	NM	23.15	NM	9.80	NM	10.20	NM	5.84	NM	29.29	NM	10.17	NM	5.57	NM	24.46	NM	3.91	NM
28-Jan-10	12.31	NM	17.66	NM	18.66	NM	35.30	NM	20.81	NM	22.44	NM	17.63	NM	24.58	NM	30.62	NM	34.90	NM	7.77	NM	7.02	NM	38.37	NM	24.51
4-Mar-10	11.12	NM	12.69	NM	5.28	NM	36.15	NM	16.77	NM	17.95	NM	11.72	NM	22.46	NM	35.95	NM	36.74	NM	8.74	NM	5.64	NM	44.14	NM	18.40
25-Mar-10	NM	9.12	NM	21.28	NM	15.05	NM	18.55	NM	20.46	NM	6.70	NM	12.31	NM	4.21	NM	31.51	NM	9.06	NM	10.21	NM	21.45	NM	11.44	NM
15-Apr-10	12.66	NM	11.91	MM	7.73	NM	34.11	MM	13.66	NM	16.07	NM	8.84	NM	17.38	NM	28.24	NM	32.42	NM	5.52	NM	5.84	NM	38.12	NM	15.17
29-Apr-10	NM	5.86	NM	15.39	NM	14.48	NM	16.40	NM	19.59	NM	3.66	NM	8.44	NM	3.47	NM	31.69	NM	11.08	NM	5.70	NM	19.96	NM	9.36	NM
20-May-10	7.53	NM	8.88	NM	5.03	NM	34.40	NM	16.12	NM	12.58	NM	6.37	NM	13.55	NM	32.97	NM	29.75	NM	4.27	NM	7.03	NM	39.17	NM	10.69
3-Jun-10	NM	7.25	NM	10.32	NM	12.25	NM	15.34	NM	18.05	NM	3.97	NM	30.29	NM	3.25	NM	30.08	NM	8.05	NM	5.58	NM	15.31	NM	4.93	NM
17-Jun-10	7.77	NM	6.53	NM	6.28	NM	26.71	NM	14.02	NM	10.05	NM	3.52	NM	11.63	NM	30.33	NM	35.01	NM	3.70	NM	6.02	NM	38.61	NM	6.67
							-																				

^{*}All DO data is in (mg/L)

Note: During O&M visits, DO readings were not taken from all wells due to time contraints (54 inj points). Therefore, half of the readings were taken per visit. Initially they were read in order, however it was decided to read every other point each time so that each visits data covered the whole On 15 April 2009, IW-3D was under water, therefore, no DO reading was collected
After 30 April 2009, IW-4S became injection well at that location.

*System off on 11-13-09 due to paving along 17th street. System restarted on 11-18-09 (finishing paving - could only read inj points along side street).

TABLE 4a



SUNOCO-PHILADELPHIA REFINERY, 26TH STREET (AOI-1) SUMMARY OF OXYGEN INJECTION REMEDIATION SYSTEM <u>ORP</u> FIELD DATA SHALLOW WELLS ONLY

DATE	IW-1S	IW-2S	IW-3S	IW-4S	IW-5S	IW-6S	IW-7S	IW-8S	IW-9S	IW-10S	IW-11S	IW-12S	IW-13S	IW-14S	IW-15S	IW-16S	IW-17S	IW-18S	IW-19S	IW-20S	IW-21S	IW-22S	IW-23S	IW-24S	IW-25S	IW-26S	IW-27S
25-Mar-09	16	-183	-126	-262	-102	-11	-47	-71	-27	-74	-20	-193	-135	-127	-148	-169	-183	-180	-174	-182	-221	-150	-162	-239	-213	166	-121
8-Apr-09	-88	-43	141	272	-4	309	205	104	316	206	81	325	1	292	116	297	287	299	294	368	125	257	219	32	240	269	78
15-Apr-09	-5	-20	NM-I	64	-77	34	-24	51	69	24	-21	56	-1	64	3.36	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
22-Apr-09	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	47	57	45	87	83	112	24	51	-43	32	33	-50
6-May-09	69	NM	157	NM	-68	NM	17	NM	286	NM	-14	NM	153	NM	-51	NM	270	NM	296	NM	319	NM	312	NM	316	NM	-2
21-May-09	NM	5.72	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	37.8	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
4-Jun-09	29	NM	-81	NM	-116	NM	-89	NM	110	NM	-88	NM	96	NM	-86	NM	55	NM	70	NM	23	NM	116	NM	153	NM	-4
23-Jun-09	NM	-105	NM	123	NM	144	NM	145	NM	165	NM	165	NM	127	NM	36	NM	40	NM	70	NM	115	NM	-114	NM	40	NM
8-Jul-09	-23	NM	-116	NM	-105	NM	-61	NM	48	NM	-94	NM	35	NM	-74	NM	26	NM	47	NM	30	NM	94	NM	84	NM	99
22-Jul-09	NM	-120	NM	68	NM	90	NM	84	NM	105	NM	92	NM	21	NM	51	NM	64	NM	53	NM	-3	NM	-89	NM	-5	NM
4-Aug-09	-150	NM	-41	NM	-114	NM	-101	NM	-17	NM	-100	NM	8	NM	-97	NM	13	NM	-5	NM	-22	NM	-4	NM	28	NM	52
19-Aug-09	NM	-119	NM	13	NM	51	NM	51	NM	80	NM	54	NM	27	NM	53	NM	46	NM	52	NM	35	NM	-91	NM	9	NM
9-Sep-09	13	NM	-105	NM	-100	NM	-65	NM	58	NM	-92	NM	27	NM	-79	NM	0	NM	18	NM	58	NM	42	NM	47	NM	75
23-Sep-09	NM	-94	NM	30	NM	86	NM	113	NM	135	NM	129	NM	30	NM	49	NM	40	NM	8	NM	48	NM	-72	NM	14	NM
7-Oct-09	-33	NM	-141	NM	-90	NM	-60	NM	23	NM	-75	NM	34	NM	-75	NM	-3	NM	20	NM	28	NM	30	NM	42	NM	78
21-Oct-09	NM	-98	NM	-66	NM	36	NM	74	NM	103	NM	116	NM	4	NM	25	NM	46	NM	52	NM	3	NM	-70	NM	36	NM
18-Nov-09	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	5	52	75	67	-5	61
2-Dec-09	-6	NM	30	NM	8	NM	40	NM	69	NM	31	NM	52	NM	51	NM -	68	NM	77	NM	79	NM	84	NM	92	NM	80
16-Dec-09	NM	103	NM	108	NM	22	NM	-4	NM 47	42	NM	42	NM 4C	401	NM 24	/ NIN 4	NM 27	11	NM 47	50	NM 45	O NINA	NM	24	NM 40	68	NM 70
30-Dec-09 14-Jan-10	-22 NM	NM 52	23 NM	NM 107	42 NM	NM 123	62 NM	NM 50	47 NM	NM	-44 NM	NM 117	46	NM 478	24 NM	NM 139	37 NM	NM	47 NM	NM 146	45 NM	NM	34 NM	NM 72	46 NM	NM 100	73 NM
	_	53 NA						58		82 NM			NM 76					120				55 NM				NM	
28-Jan-10	39	NM	76	NM	-49	NM	30	NM	52	NM	-36	NM	76	NM	3	NM	37	NM	48	NM	26	NM	36	NM	46	NM	70
4-Mar-10 25-Mar-10	NM	-19	65 NM	NM 37	82 NM	NM 38	-6 NM	NM 15	47 NM	NM -21	-22 NM	NM 8	61 NM	NM 306	NM	NM 140	36 NM	NM 120	29 NM	NM 127	14 NM	NM 3	17 NM	NM 13	26 NM	43	61 NM
15-Apr-10	17	NM	68		64	NM		NM	2	NM		NM		NM		NM	27	NM		NM		-	15	NM	10	NM	30
	NM	1	NM	NM			84 NM		NM		-35 NM		58 NM		-11 NM		NM		43 NM		-20 NM	NM		-1	NM		
29-Apr-10	INIVI	-8 NIM		29 NM	NM 50	37 NM		-2 NM	7	18		-8 NIM		227 NM	NM 4	-3 NM		13 NM	NM 4	28 NM		-12	NM	NM	INIVI	23 NM	NM 42
20-May-10	NIM	NM 1.4	47 NM	NM	58	NM 21	68 NM	NM 24	/ NIM	NM 17	-55 NIM	NM	24	NM 102	4 NIM	NM	-12	NM	-4 NIM	NM	-33 NIM	NM 24	-26		4 NIM		42
3-Jun-10	NM	-14 NA	NM	Ŏ NIN 4	NM	21	NM	21	NM	17	NM 24	-11 NIM	NM	102	NM 24	-26	NM	-12	NM	8	NM 40	-24	NM	-26	NM	-22 NA	NM 10
17-Jun-10	ŏ	NM	59	NM	60	NM	80	NM	-3	NM	-31	NM	ь	NM	-24	NM	5	NM	15	NM	-49	NM	-13	NM	-15	NM	18

^{*}All ORP data is in (mV)

Note: On 15 April 2009 ORP readings were not taken from all wells due to time contraints. IW-3S was under water, therefore, no ORP reading was collected *System off on 11-13-09 due to paving along 17th street. System restarted on 11-18-09 (finishing paving - could only read inj points along side street). System shut down on 11-13-09 due to paving activities; restarted on 11-18-09. Upon restart, switched injection to shallow points except deep injection at IP-17, 18 & 19. No well readings collected in February 2010 due to multiple heavy snow events (wells burried).

TABLE 4b



SUNOCO-PHILADELPHIA REFINERY, 26TH STREET (AOI-1) SUMMARY OF OXYGEN INJECTION REMEDIATION SYSTEM <u>ORP</u> FIELD DATA <u>DEEP WELLS ONLY</u>

DATE	IW-1D	IW-2D	IW-3D	IW-4D	IW-5D	IW-6D	IW-7D	IW-8D	IW-9D	IW-10D	IW-11D	IW-12D	IW-13D	IW-14D	IW-15D	IW-16D	IW-17D	IW-18D	IW-19D	IW-20D	IW-21D	IW-22D	IW-23D	IW-24D	IW-25D	IW-26D	IW-27D
25-Mar-09	-43	-91	-105	-218	-153	-75	-8	-83	-53	-145	-27	-148	-160	-124	-126	-172	-186	-179	-170	-231	-144	-151	-164	-203	-182	-144	-33
8-Apr-09	-58	139	167	24	292	262	353	320	325	323	311	288	292	290	352	317	201	245	282	211	334	162	280	268	304.8	255	322
15-Apr-09	5	21	NM-I	29	66	-3	11	40	55	48	8	41	51	40	26	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
22-Apr-09	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	42	4	4	53	28	99	-35	46	74	16	-9	45
6-May-09	29	NM	189	NM	188	NM	290	NM	277	NM	302	NM	284	NM	251	NM	228	NM	307	NM	336	NM	317	NM	276	NM	341
21-May-09	NM	39.77	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
4-Jun-09	-120	NM	109	NM	55	NM	42	NM	100	NM	110	NM	54	NM	80	NM	34	NM	29.6	NM	74	NM	135	NM	138	NM	185
23-Jun-09	NM	48	NM	43	NM	123	NM	144	NM	152	NM	153	NM	197	NM	179	NM	13	NM	8	NM	76	NM	149	NM	6	NM
8-Jul-09	-144	NM	56	NM	-2	NM	27	NM	51	NM	56	NM	23	NM	26	NM	24	NM	47	NM	84	NM	112	NM	59	NM	65
22-Jul-09	NM	18	NM	44	NM	93	NM	87	NM	90	NM	94	NM	89	NM	53	NM	22	NM	23	NM	27	NM	-18	NM	40	NM
4-Aug-09	-3	NM	-159	NM	-36	NM	11	NM	32	NM	-35	NM	54	NM	-44	NM	34	NM	17	NM	-4	NM	31	NM	23	NM	74
19-Aug-09	NM	12	NM	-2	NM	41	NM	52	NM	46	NM	56	NM	75	NM	40	NM	28	NM	62	NM	43	NM	-22	NM	-4	NM
9-Sep-09	-150	NM	48	NM	-41	NM	-5	NM	32	NM	37	NM	3	NM	17	NM	4	NM	3	NM	30	NM	49	NM	43	NM	72
23-Sep-09	NM	30	NM	9	NM	78	NM	106	NM	113	NM	133	NM	120	NM	45	NM	39	NM	1	NM	43	NM	43	NM	-10	NM
7-Oct-09	-168	NM	3	NM	-39	NM	-15	NM	8	NM	23	NM	-12	NM	22	NM	-13	NM	-3	NM	34	NM	30	NM	38	NM	60
21-Oct-09	NM	44	NM	-25	NM	28	NM	76	NM	68	NM	111	NM	107	NM	7	NM	44	NM	27	NM	-12	NM	-31	NM	-10	NM
18-Nov-09	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	-27	32	47	61	-16	38
2-Dec-09	-12	NM	39	NM	4	NM	58	NM	76	NM	-9	NM	55	NM	43	NM	75	NM	77	NM	66	NM	94	NM	84	NM	72
16-Dec-09	NM	110	NM 40	108	NM 7	-4 NA	NM 45	18 NM	NM	28	NM 40	32	NM	45	NM	-16 NM	NM	-10 NA	NM 27	32	NM	-41 NA	NM 47	-4	NM 24	43 NM	NM 54
30-Dec-09 14-Jan-10	-158 NM	NM 50	12 NM	NM	NM	NM 121	45 NM		11 NM	NM 57	42	NM 111	-26	NM	NM	167	16 NM	NM 114	27 NM	NM 127	53 NM	NM	17 NM	NM 34	31 NM		54 NM
28-Jan-10		52 NM		96 NM		121	_	43 NM		57 NM	NM	NM	NM	39 NM		NM	INIVI	NM		127 NM		-28		NM		84 NM	
	-144		72	NM	56	NM	-6	NM	30		39		-6		-39		4		38		30	NM	20		41		56
4-Mar-10	-148	NM	54	NM	87 NA	NM	-42 NA		12	NM	35	NM 10	-13	NM 40	-35 NA	NM 450	19	NM 405	3	NM 405	25 NM	NM	-11 NA	NM 4	28	NM	44
25-Mar-10	NM	-35 NA	NM	-6 NA	NM 77	23	NM 70	29	NM	-41 NA	NM	-10 NA	NM	10	NM	152	NM	125	NM	105	NM 40	-66 NA	NM	-4	NM	27	NM
15-Apr-10	-138	NM	42	NM	77	NM 47	76	NM 10	-52 NA	NM	-6	NM	-23	NM	-43 NA	NM 24	26	NM	28	NM	-49	NM	-8 NA	NM	15 NM	NM	25 NA
29-Apr-10	NM	-13 NA	NM 47	3	NM	17	NM	-16 NIM	NM 24	-3 NIM	NM	5	NM	-25 NA	NM	-34	NM	6	NM	-3 NA	NM	-70	NM	-14	NM 45	8	NM 24
20-May-10	-158	NM	17	NM	52	NM	68	NM	-31	NM	6	NM	-59	NM	-14	NM	-20	NM	-20	NM	-59	NM	-65	NM	-15	NM	31
3-Jun-10	NM	-6	NM	-7	NM	1	NM	20	NM	9	NM	-24	NM	230	NM	-51	NM	-22	NM	-17	NM	-63	NM	-36	NM	-27	NM
17-Jun-10	-221	NM	39	NM	58	NM	65	NM	-36	NM	-4	NM	-32	NM	-45	NM	-6	NM	-4	NM	-70	NM	-34	NM	-18	NM	7

^{*}All ORP data is in (mV)

Note: On 15 April 2009 ORP readings were not taken from all wells due to time contraints. IW-3D was under water, therefore, no reading was collected System shut down on 11-13-09 due to paving activities; restarted on 11-18-09. Upon restart, switched injection to shallow points except deep injection at IP-17, 18 & 19. No well readings collected in February 2010 due to multiple heavy snow events (wells burried).



ATTACHMENT A

Groundwater Laboratory Analytical Data



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ANALYTICAL RESULTS

Prepared by:

Prepared for:

Lancaster Laboratories 2425 New Holland Pike Lancaster, PA 17605-2425 SUN: Aquaterra Tech. PO Box 744 West Chester PA 19381

June 11, 2010

Project: SUN: Philadelphia Refinery 26th Street South

Submittal Date: 06/03/2010 Group Number: 1197418 PO Number: PHILADELPHIA State of Sample Origin: PA

Client Sample Description Lancaster Labs (LLI) #

S-230_060110 Grab Water 5998405 S-210_060110 Grab Water 5998406

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC Langan Attn: Dennis Webster

COPY TO

ELECTRONIC SUN: Aquaterra Tech. Attn: Tiffani Doerr

COPY TO

ELECTRONIC LLI Attn: EDD Group

COPY TO

ELECTRONIC Langan Attn: Kristen Ward

COPY TO

ELECTRONIC Aquaterra Tech Attn: Loretta Belfiglio

COPY TO



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Questions? Contact your Client Services Representative Jessica A Oknefski at (717) 656-2300 Ext. 1815

Respectfully Submitted,

Susan M. Goshert Group Leader

Susan M Goshert



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Page 1 of 1

Sample Description: S-230 060110 Grab Water

Philadelphia Refinery 26th Street

COC: 232717 S-230 060110

LLI Group # 1197418 Account # 10132

LLI Sample # WW 5998405

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 12:25 by JRW SUN: Aquaterra Tech.

PO Box 744

West Chester PA 19381

Submitted: 06/03/2010 17:50 Reported: 06/11/2010 19:36

Discard: 08/11/2010

230S-

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles S	SW-846	8260B	ug/l	ug/l	
10943	Benzene		71-43-2	610	10	10
10943	Ethylbenzene		100-41-4	19	1	1
10943	Methyl Tertiary Butyl	l Ether	1634-04-4	< 1	1	1
10943	Toluene		108-88-3	3	1	1
10943	Xylene (Total)		1330-20-7	17	1	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11 Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101583AA	06/08/2010 07:17	Kelly E Keller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	2	P101611AA	06/10/2010 15:03	Daniel H Heller	10
10943	UST BTEX, MTBE in Water	SW-846 8260B	1	P101583AA	06/08/2010 07:17	Kelly E Keller	1
10943	UST BTEX, MTBE in Water	SW-846 8260B	1	P101611AA	06/10/2010 15:03	Daniel H Heller	10



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Page 1 of 1

Sample Description: S-210 060110 Grab Water

Philadelphia Refinery 26th Street

COC: 232717 S-210 060110

LLI Group # 1197418 Account # 10132

LLI Sample # WW 5998406

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 11:40 by JRW SUN: Aquaterra Tech.

PO Box 744

West Chester PA 19381

Submitted: 06/03/2010 17:50 Reported: 06/11/2010 19:36

Discard: 08/11/2010

210S-

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Limit of Quantitation	Dilution Factor
GC/MS	Volatiles SW-846	8260B	ug/l	ug/l	
10943	Benzene	71-43-2	39,000	200	200
10943	Ethylbenzene	100-41-4	620	20	20
10943	Methyl Tertiary Butyl Ether	1634-04-4	140	20	20
10943	Toluene	108-88-3	99	20	20
10943	Xylene (Total)	1330-20-7	760	20	20

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11 Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101583AA	06/08/2010 07:44	Kelly E Keller	20
01163	GC/MS VOA Water Prep	SW-846 5030B	2	P101583AA	06/08/2010 08:12	Kelly E Keller	200
10943	UST BTEX, MTBE in Water	SW-846 8260B	1	P101583AA	06/08/2010 07:44	Kelly E Keller	20
10943	UST BTEX, MTBE in Water	SW-846 8260B	1	P101583AA	06/08/2010 08:12	Kelly E Keller	200



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Page 1 of 2

Quality Control Summary

Client Name: SUN: Aquaterra Tech. Group Number: 1197418

Reported: 06/11/10 at 07:36 PM

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the

Laboratory Compliance Quality Control

Analysis Name	Blank <u>Result</u>	Blank <u>LOO</u>	Report <u>Units</u>	LCS %REC	LCSD %REC	LCS/LCSD <u>Limits</u>	RPD	RPD Max
Batch number: P101583AA	Sample numbe	er(s): 599	8405-5998	406				
Benzene	< 1	1.	ug/l	94		79-120		
Ethylbenzene	< 1	1.	ug/l	88		79-120		
Methyl Tertiary Butyl Ether	< 1	1.	ug/l	98		76-120		
Toluene	< 1	1.	ug/l	91		79-120		
Xylene (Total)	< 1	1.	ug/l	87		80-120		
Batch number: P101611AA	Sample numbe	er(s): 599	8405					
Benzene	< 1	1.	ug/l	99	100	79-120	1	30

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS <u>%REC</u>	MSD %REC	MS/MSD <u>Limits</u>	RPD	RPD <u>MAX</u>	BKG <u>Conc</u>	DUP <u>Conc</u>	DUP <u>RPD</u>	Dup RPD <u>Max</u>
Batch number: P101583AA	Sample	number(s)	: 5998405	-59984	06 UNSP	K: P998449			
Benzene	111	114	80-126	1	30				
Ethylbenzene	145 (2)	146 (2)	71-134	0	30				
Methyl Tertiary Butyl Ether	91	100	72-126	9	30				
Toluene	98	103	80-125	4	30				
Xylene (Total)	105	109	79-125	2	30				
Batch number: P101611AA Benzene	Sample 106	number(s)	: 5998405 80-126	UNSPK	: P9984	62			

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed $\ensuremath{\mathsf{QC}}$ unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: UST BTEX, MTBE in Water

Batch number: P101583AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene		
5998405	96	101	100	98		
5998406	95	99	102	98		
Blank	99	104	100	97		
LCS	98	103	100	98		
MS	96	103	100	101		

- *- Outside of specification
- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



78-113

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77-113

Page 2 of 2

Quality Control Summary

Client Name: SUN: Aquaterra Tech. Group Number: 1197418

Reported: 06/11/10 at 07:36 PM

80-116

Limits:

Surrogate Quality Control

80-113

		Durrogues &	uurroj comerer	
MSD	96	102	100	102
Limits:	80-116	77-113	80-113	78-113
	Name: UST BTEX, MTBE in Wa ber: P101611AA	ter		
	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
Blank	98	102	99	96
LCS	98	106	99	96
LCSD	96	106	99	96
MS	97	105	100	97

^{*-} Outside of specification

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

Analysis Request/ Environmental Services Chain of Custody

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	Laboratories

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
С	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
ug	microgram(s)	mg	milligram(s)
ml	milliliter(s)	I	liter(s)
m3	cubic meter(s)	ul	microliter(s)

- < less than The number following the sign is the <u>limit of quantitation</u>, the smallest amount of analyte which can be reliably determined using this specific test.
- greater than
- J estimated value The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).
- ppm parts per million One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.
- ppb parts per billion
- **Dry weight basis**Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

U.S. EPA CLP Data Qualifiers:

	Organic Qualifiers		Inorganic Qualifiers
Α	TIC is a possible aldol-condensation product	В	Value is <crdl, but="" th="" ≥idl<=""></crdl,>
В	Analyte was also detected in the blank	Ε	Estimated due to interference
С	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	S	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
Р	Concentration difference between primary and	W	Post digestion spike out of control limits
	confirmation columns >25%	*	Duplicate analysis not within control limits
U	Compound was not detected	+	Correlation coefficient for MSA < 0.995
X,Y,Z	Defined in case narrative		

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

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ANALYTICAL RESULTS

Prepared by:

Prepared for:

Lancaster Laboratories 2425 New Holland Pike Lancaster, PA 17605-2425 SUN: Aquaterra Tech. PO Box 744 West Chester PA 19381

June 17, 2010

Project: SUN: Philadelphia Refinery 26th Street South

Submittal Date: 06/03/2010 Group Number: 1197217 PO Number: PHILADELPHIA State of Sample Origin: PA

Client Sample Description	<u>Lancaster Labs (LLI) #</u>
S-52_060110 Grab Water	5997029
S-50_060110 Grab Water	5997030
S-231_060110 Grab Water	5997031
S-232_060110 Grab Water	5997032
S-117_060110 Grab Water	5997033

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Langan	Attn: Dennis Webster
SUN: Aquaterra Tech.	Attn: Tiffani Doerr
LLI	Attn: EDD Group
Langan	Attn: Kristen Ward
Aquaterra Tech	Attn: Loretta Belfiglio
•	_
	SUN: Aquaterra Tech. LLI Langan



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Questions? Contact your Client Services Representative Jessica A Oknefski at (717) 656-2300 Ext. 1815

Respectfully Submitted,

Diane L. Lockard Principal Microbiologist Group Leader



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Sample Description: S-52 060110 Grab Water

Philadelphia Refinery 26th St. South

COC: 230370 S-52 060110

LLI Sample # WW 5997029 LLI Group # 1197217 Account # 10132

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 10:00 by JRW SUN: Aquaterra Tech.

PO Box 744

West Chester PA 19381

As Received

Submitted: 06/03/2010 17:50 Reported: 06/17/2010 16:18

Discard: 08/17/2010

S52-6

CAT No.	Analysis Name			CAS Number	As Received Result	As Received Limit of Quantitation	Dilution Factor
Wet Cl	hemistry	EPA	300.0		mg/l	mg/l	
00228	Sulfate			14808-79-8	8.9	5.0	5
		ED¥	353.2		mg/l	mg/l	
00220	Nitrate Nitrogen	BFA	333.2	14797-55-8	< 0.10	0.10	1
00219				14797-65-0		0.050	1
	The holding time was outside of the hold			he sample was s	submitted to the laboratory		
		EPA	415.1		mg/l	mg/l	
01550	Total Carbon			n.a.	157	5.0	5
		SM20	5310	C	mg/l	mg/l	
00273	Total Organic Carbon			n.a.	25.8	1.0	1
		SM20	2320	В	mg/l as CaCO3	mg/l as CaCO3	
00202	Alkalinity to pH 4.		2320	n.a.	362	2.0	1
	Alkalinity to pH 8.			n.a.	< 2.0	2.0	1
		arro 0	0540	a	/1	/1	
00010	m . 1 D' 1 1 C 1		2540		mg/1	mg/l	-
00212	Total Dissolved Sol	ıas		n.a.	324	30.0	1
		SM20	3500	Fe B	mg/l	mg/l	
		modi					
08344	Ferrous Iron			n.a.	19.0	10.0	100
		GM20	5210	D	mg/l	mg/l	
00235	Biochemical Oxygen 1			n.a.	< 5.9	5.9	1
00233		s not	met. T		ubmitted to the laboratory	3.3	1
Microl	biology	SM20	9215	В	cfu/mL	cfu/mL	
	HC Degrading Bacter	ia in	Water	n.a.	< 100	100	1



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Page 2 of 2

Sample Description: S-52 060110 Grab Water

Philadelphia Refinery 26th St. South

COC: 230370 S-52 060110

LLI Sample # WW 5997029 LLI Group # 1197217 Account # 10132

n.a.

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 10:00 by JRW SUN: Aquaterra Tech.

PO Box 744

Submitted: 06/03/2010 17:50 West Chester PA 19381

Reported: 06/17/2010 16:18

Discard: 08/17/2010

S52-6

CAT Analysis Name CAS Number Result Quantitation Factor

Microbiology SM20 9215 B cfu/mL cfu/mL

This result is an estimated count. At least one plate used to calculate the result is outside the established counting range of 30 to 300 colony forming units (cfu) per dilution.

Samples for this study were begun by Kim Small on 6/04/10 at 11:33. Samples were analyzed using a modification of the technique outlined in Standard Methods for the Examination of Water and Wastewater, 20th edition, 1998: '9215-B Heterotrophic Plate Count, Pour Plate Method' p 9-37.

Modifications to the technique involve the introduction of a sole carbon source (hexadecane) to the growth system in a minimal salts agar medium and incubating the plates for 7-9 days. These modifications are outlined in the Retec Laboratory Method #510, dated January 22, 1991. No validation studies of the modifications have been performed by this laboratory.

00307 Heterotrophic Plate Count n.a. 240

This result is an estimated count. At least one plate used to calculate the result is outside the established counting range of 30 to 300 colony forming units (cfu) per dilution.

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	-		Dilution
No.			Date and Time					Factor
00228	Sulfate	EPA 300.0	1	10165196601B	06/15/2010	02:08	Ashley M Adams	5
00220	Nitrate Nitrogen	EPA 353.2	1	10161106101A	06/10/2010	19:38	Venia B McFadden	1
00219	Nitrite Nitrogen	EPA 353.2	1	10154105103A	06/03/2010	21:07	Joseph E McKenzie	1
01550	Total Carbon	EPA 415.1	1	10159049501A	06/08/2010	00:36	James S Mathiot	5
00273	Total Organic Carbon	SM20 5310 C	1	10158049502A	06/07/2010	01:55	James S Mathiot	1
00202	Alkalinity to pH 4.5	SM20 2320 B	1	10155020201B	06/04/2010	12:37	Geraldine C Smith	1
00201	Alkalinity to pH 8.3	SM20 2320 B	1	10155020201B	06/04/2010	12:37	Geraldine C Smith	1
00212	Total Dissolved Solids	SM20 2540 C	1	10155021201B	06/04/2010	09:25	Susan E Hibner	1
08344	Ferrous Iron	SM20 3500 Fe B	1	10155834401A	06/04/2010	01:05	Daniel S Smith	100
		modified						
00235	Biochemical Oxygen Demand	SM20 5210 B	1	10155023502A	06/04/2010	10:10	Hannah M Royer	1
06157	HC Degrading Bacteria in	SM20 9215 B	1	060410KS	06/11/2010	16:13	Kimberly A Small	1
	Water							
00307	Heterotrophic Plate Count	SM20 9215 B	1	060310KAH	06/06/2010	09:45	Keith A Hoover	n.a.



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Sample Description: S-50 060110 Grab Water

Philadelphia Refinery 26th St. South

COC: 230370 S-50 060110

LLI Sample # WW 5997030 LLI Group # 1197217

Account # 10132

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 11:50 by JRW SUN: Aquaterra Tech.

PO Box 744

West Chester PA 19381

As Received

Submitted: 06/03/2010 17:50 Reported: 06/17/2010 16:18

Discard: 08/17/2010

S50-6

CAT No.	Analysis Name			CAS Number	As Received Result	Limit of Quantitation	Dilution Factor
Wet C	hemistry	EPA	300.0		mg/l	mg/l	
00228	Sulfate			14808-79-8	< 5.0	5.0	5
		EPA	353.2		mg/l	mg/l	
00220				14797-55-8		0.10	1
00219		a not	met T	14797-65-0	0.078 ubmitted to the laboratory	0.050	1
	outside of the hold			ne sampre was s	ubmitted to the laboratory		
		EPA	415.1		mg/l	mg/l	
01550	Total Carbon			n.a.	179	5.0	5
		SM20	5310	C	mg/l	mg/l	
00273	Total Organic Carbo		, 3310	n.a.	18.9	1.0	1
	3						
			2320	В	mg/l as CaCO3	mg/l as CaCO3	
	Alkalinity to pH 4.			n.a.	378	2.0	1
00201	Alkalinity to pH 8.	3		n.a.	< 2.0	2.0	1
		SM20	2540	С	mg/l	mg/l	
00212	Total Dissolved Sol	ids		n.a.	553	60.0	1
		SM20	3500	Fe B	mg/l	mg/l	
			fied				
08344	Ferrous Iron			n.a.	102	20.0	200
				_	(3	(-	
00005	D' 1 ' 10		5210		mg/1	mg/l	-
00235		s not	met. T	n.a. he sample was s	13.5 ubmitted to the laboratory	3.0	1
Microl	biology	SM20	9215	В	cfu/mL	cfu/mL	
	HC Degrading Bacter				< 100	100	1



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Sample Description: S-50 060110 Grab Water

Philadelphia Refinery 26th St. South

COC: 230370 S-50 060110

LLI Sample # WW 5997030 LLI Group # 1197217 Account # 10132

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 11:50 by JRW SUN: Aquaterra Tech.

PO Box 744

Submitted: 06/03/2010 17:50 West Chester PA 19381

Reported: 06/17/2010 16:18

Discard: 08/17/2010

S50-6

CAT As Received Limit of Dilution Result Quantitation Factor

Microbiology SM20 9215 B cfu/mL cfu/mL

This result is an estimated count. At least one plate used to calculate the result is outside the established counting range of 30 to 300 colony forming units (cfu) per dilution.

Samples for this study were begun by Kim Small on 6/04/10 at 11:33. Samples were analyzed using a modification of the technique outlined in Standard Methods for the Examination of Water and Wastewater, 20th edition, 1998: '9215-B Heterotrophic Plate Count, Pour Plate Method' p 9-37.

Modifications to the technique involve the introduction of a sole carbon source (hexadecane) to the growth system in a minimal salts agar medium and incubating the plates for 7-9 days. These modifications are outlined in the Retec Laboratory Method #510, dated January 22, 1991. No validation studies of the modifications have been performed by this laboratory.

00307 Heterotrophic Plate Count n.a. 1,300 1 n.a.

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	10165196601B	06/15/2010	03:25	Ashley M Adams	5
00220	Nitrate Nitrogen	EPA 353.2	1	10161106101A	06/10/2010	19:39	Venia B McFadden	1
00219	Nitrite Nitrogen	EPA 353.2	1	10154105103A	06/03/2010	21:11	Joseph E McKenzie	1
01550	Total Carbon	EPA 415.1	1	10159049501A	06/08/2010	00:40	James S Mathiot	5
00273	Total Organic Carbon	SM20 5310 C	1	10158049502A	06/07/2010	02:03	James S Mathiot	1
00202	Alkalinity to pH 4.5	SM20 2320 B	1	10155020201B	06/04/2010	12:37	Geraldine C Smith	1
00201	Alkalinity to pH 8.3	SM20 2320 B	1	10155020201B	06/04/2010	12:37	Geraldine C Smith	1
00212	Total Dissolved Solids	SM20 2540 C	1	10155021201B	06/04/2010	09:25	Susan E Hibner	1
08344	Ferrous Iron	SM20 3500 Fe B	1	10155834401A	06/04/2010	01:05	Daniel S Smith	200
		modified						
00235	Biochemical Oxygen Demand	SM20 5210 B	1	10155023502A	06/04/2010	10:10	Hannah M Royer	1
06157	HC Degrading Bacteria in Water	SM20 9215 B	1	060410KS	06/11/2010	16:13	Kimberly A Small	1
00307	Heterotrophic Plate Count	SM20 9215 B	1	060310KAH	06/06/2010	09:45	Keith A Hoover	n.a.



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Sample Description: S-231 060110 Grab Water

Philadelphia Refinery 26th St. South

COC: 230370 S-231 060110

LLI Group # 1197217 Account # 10132

LLI Sample # WW 5997031

Dilution

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 13:40 by JRW SUN: Aquaterra Tech.

PO Box 744

As Received

Submitted: 06/03/2010 17:50 West Chester PA 19381

As Received

Reported: 06/17/2010 16:18

Discard: 08/17/2010

S2316

CAT

CAT No.	Analysis Name			CAS Number	As Received Result	Limit of Quantitation	Dilution Factor
Wet Ch	nemistry	EPA	300.0		mg/l	mg/l	
	Sulfate			14808-79-8	< 5.0	5.0	5
		EPA	353.2		mg/l	mg/l	
00220	Nitrate Nitrogen			14797-55-8	< 0.10	0.10	1
00219	Nitrite Nitrogen	~ ~~+	mat	14797-65-0	0.10	0.050	1
	The holding time was outside of the hold			ne sampie was s	submitted to the laboratory		
		EPA	415.1		mg/l	mg/l	
01550	Total Carbon			n.a.	208	5.0	5
		SM2	5310	С	mg/l	mg/l	
00273	Total Organic Carbon	n		n.a.	25.0	1.0	1
		SM2	2320	В	mg/l as CaCO3	mg/l as CaCO3	
00202	Alkalinity to pH 4.			n.a.	376	2.0	1
00201	Alkalinity to pH 8.	3		n.a.	< 2.0	2.0	1
			2540		mg/l	mg/l	
00212	Total Dissolved Sol	ids		n.a.	820	120	1
			3500	Fe B	mg/l	mg/l	
		modi	fied				
08344	Ferrous Iron			n.a.	119	20.0	200
			5210	В	mg/l	mg/l	
00235	Biochemical Oxygen			n.a.	34.1	3.0	1
	The holding time was outside of the hold			ne sample was s	submitted to the laboratory		
Microb	oiology	SM2	9215	В	cfu/mL	cfu/mL	
06157					< 100	100	1
					on 6/04/10 at 11:33.		
					the technique outlined in and Wastewater, 20th		
					ount, Pour Plate Method' p		
	Modifications to the	a tech	nime i	nvolve the intr	roduction of a sole carbon		
			-		ninimal salts agar medium		
	and incubating the	plates	for 7-	9 days. These m	odifications are outlined		
					ary 22, 1991. No validation	ı	
00307	studies of the modi: Heterotrophic Plate			e been performe n.a.	ed by this laboratory. 3,000	1	n.a.
00307	necerotrophic Place	Couli	-	11.a.	3,000	±	11.a.



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Sample Description: S-231 060110 Grab Water

Philadelphia Refinery 26th St. South

COC: 230370 S-231 060110

LLI Sample # WW 5997031 LLI Group # 1197217 Account # 10132

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 13:40 by JRW SUN: Aquaterra Tech.

PO Box 744

Submitted: 06/03/2010 17:50 West Chester PA 19381

Reported: 06/17/2010 16:18

Discard: 08/17/2010

S2316

As Received CAT Dilution As Received Limit of Analysis Name CAS Number No. Factor Quantitation

cfu/ml cfu/ml Microbiology SM20 9215 B

This result is an estimated count. At least one plate used to calculate the result is outside the established counting range of 30 to 300 $\,$

colony forming units (cfu) per dilution.

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
00228	Sulfate	EPA 300.0	1	10165196601B	06/15/2010	03:41	Ashley M Adams	5
00220	Nitrate Nitrogen	EPA 353.2	1	10161106101A	06/10/2010	19:40	Venia B McFadden	1
00219	Nitrite Nitrogen	EPA 353.2	1	10154105103A	06/03/2010	21:12	Joseph E McKenzie	1
01550	Total Carbon	EPA 415.1	1	10159049501A	06/08/2010	00:46	James S Mathiot	5
00273	Total Organic Carbon	SM20 5310 C	1	10158049502A	06/07/2010	02:25	James S Mathiot	1
00202	Alkalinity to pH 4.5	SM20 2320 B	1	10155020201B	06/04/2010	12:37	Geraldine C Smith	1
00201	Alkalinity to pH 8.3	SM20 2320 B	1	10155020201B	06/04/2010	12:37	Geraldine C Smith	1
00212	Total Dissolved Solids	SM20 2540 C	1	10155021201B	06/04/2010	09:25	Susan E Hibner	1
08344	Ferrous Iron	SM20 3500 Fe B	1	10155834401A	06/04/2010	01:05	Daniel S Smith	200
		modified						
00235	Biochemical Oxygen Demand	SM20 5210 B	1	10155023502A	06/04/2010	10:10	Hannah M Royer	1
06157	HC Degrading Bacteria in	SM20 9215 B	1	060410KS	06/11/2010	16:13	Kimberly A Small	1
	Water							
00307	Heterotrophic Plate Count	SM20 9215 B	1	060310KAH	06/06/2010	09:45	Keith A Hoover	n.a.



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Sample Description: S-232 060110 Grab Water

Philadelphia Refinery 26th St. South

COC: 230370 S-232 060110

LLI Sample # WW 5997032 LLI Group # 1197217

10132 Account

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 14:50 by JRW SUN: Aquaterra Tech.

PO Box 744

West Chester PA 19381

Submitted: 06/03/2010 17:50 Reported: 06/17/2010 16:18

Discard: 08/17/2010

S2326

CAT No.	Analysis Name			CAS Number	As Received Result	As Received Limit of Quantitation	Dilution Factor
Wet Cl	hemistry	EPA	300.0		mg/l	mg/l	
00228	Sulfate			14808-79-8	< 5.0	5.0	5
		EPA	353.2		mg/l	mg/l	
	Nitrate Nitrogen			14797-55-8	< 0.10	0.10	1
00219	Nitrite Nitrogen				< 0.050	0.050	1
	The holding time wa outside of the hold			he sample was s	submitted to the laboratory		
		EPA	415.1		mg/l	mg/l	
01550	Total Carbon			n.a.	179	5.0	5
01000	10001 0012011			11.4.	1,0	5.0	3
		SM2	5310	C	mg/l	mg/l	
00273	Total Organic Carbo	n		n.a.	11.6	1.0	1
		SM2	2320	В	mg/l as CaCO3	mg/l as CaCO3	
00202	Alkalinity to pH 4.	5		n.a.	425	2.0	1
00201	Alkalinity to pH 8.	3		n.a.	< 2.0	2.0	1
		awa (2540	a	mg/l	mg/l	
00212	Total Dissolved Sol		2540	_	- ·	<u>.</u>	-
00212	iotai Dissolved Soi	ius		n.a.	1,110	120	1
		SM20	3500	Fe B	mg/l	mg/l	
			fied		-		
08344	Ferrous Iron	moal	illeu	n.a.	9.1	5.0	50
		SM2	5210	В	mg/l	mg/l	
00235				n.a.	< 4.4	4.4	1
	The holding time wa outside of the hold			he sample was s	submitted to the laboratory		
Microb	oiology	SM20	9215	В	cfu/mL	cfu/mL	
	HC Degrading Bacter				< 100	100	1
	55 -40001				* *		



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Sample Description: S-232 060110 Grab Water

Philadelphia Refinery 26th St. South

COC: 230370 S-232 060110

LLI Sample # WW 5997032 LLI Group # 1197217 Account # 10132

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 14:50 by JRW SUN: Aquaterra Tech.

PO Box 744

Submitted: 06/03/2010 17:50 West Chester PA 19381

Reported: 06/17/2010 16:18

Discard: 08/17/2010

S2326

CAT As Received Limit of Dilution Result Quantitation Factor

Microbiology SM20 9215 B cfu/mL cfu/mL

This result is an estimated count. At least one plate used to calculate the result is outside the established counting range of 30 to 300 colony forming units (cfu) per dilution.

Samples for this study were begun by Kim Small on 6/04/10 at 11:33. Samples were analyzed using a modification of the technique outlined in Standard Methods for the Examination of Water and Wastewater, 20th edition, 1998: '9215-B Heterotrophic Plate Count, Pour Plate Method' p 9-37.

Modifications to the technique involve the introduction of a sole carbon source (hexadecane) to the growth system in a minimal salts agar medium and incubating the plates for 7-9 days. These modifications are outlined in the Retec Laboratory Method #510, dated January 22, 1991. No validation studies of the modifications have been performed by this laboratory.

00307 Heterotrophic Plate Count n.a. 900 1 n.a.

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	10165196601B	06/15/2010	03:56	Ashley M Adams	5
00220	Nitrate Nitrogen	EPA 353.2	1	10161106101A	06/10/2010	19:41	Venia B McFadden	1
00219	Nitrite Nitrogen	EPA 353.2	1	10154105103A	06/03/2010	21:17	Joseph E McKenzie	1
01550	Total Carbon	EPA 415.1	1	10159049501A	06/08/2010	00:50	James S Mathiot	5
00273	Total Organic Carbon	SM20 5310 C	1	10158049502A	06/07/2010	02:32	James S Mathiot	1
00202	Alkalinity to pH 4.5	SM20 2320 B	1	10155020201B	06/04/2010	12:37	Geraldine C Smith	1
00201	Alkalinity to pH 8.3	SM20 2320 B	1	10155020201B	06/04/2010	12:37	Geraldine C Smith	1
00212	Total Dissolved Solids	SM20 2540 C	1	10155021201B	06/04/2010	09:25	Susan E Hibner	1
08344	Ferrous Iron	SM20 3500 Fe B	1	10155834401A	06/04/2010	01:05	Daniel S Smith	50
		modified						
00235	Biochemical Oxygen Demand	SM20 5210 B	1	10155023502A	06/04/2010	10:10	Hannah M Royer	1
06157	HC Degrading Bacteria in Water	SM20 9215 B	1	060410KS	06/11/2010	16:13	Kimberly A Small	1
00307	Heterotrophic Plate Count	SM20 9215 B	1	060310KAH	06/06/2010	09:45	Keith A Hoover	n.a.



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Page 1 of 2

Sample Description: S-117 060110 Grab Water

Philadelphia Refinery 26th St. South

COC: 230370 S-117_060110

LLI Sample # WW 5997033 LLI Group # 1197217 Account # 10132

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 16:00 by JRW SUN: Aquaterra Tech.

PO Box 744

West Chester PA 19381

Submitted: 06/03/2010 17:50 Reported: 06/17/2010 16:18

Discard: 08/17/2010

117S-

CAT No.	Analysis Name			CAS Number	As Received Result	As Received Limit of Quantitation	Dilution Factor
Wet Ch	nemistry	EPA	300.0		mg/l	mg/l	
	Sulfate			14808-79-8	177	20.0	20
		EPA	353.2		mg/l	mg/l	
00220	Nitrate Nitrogen			14797-55-8	< 0.10	0.10	1
00219	3	~ ~~+	mat [14797-65-0	< 0.050	0.050	1
	outside of the hold			ine sampie was s	submitted to the laboratory		
		EPA	415.1		mg/l	mg/l	
01550	Total Carbon			n.a.	150	5.0	5
		SM2	0 5310	C	mg/l	mg/l	
00273	Total Organic Carbo			n.a.	22.7	1.0	1
		SM2	0 2320	В	mg/l as CaCO3	mg/l as CaCO3	
00202	Alkalinity to pH 4.	5		n.a.	290	2.0	1
00201	Alkalinity to pH 8.	3		n.a.	< 2.0	2.0	1
				_	/2	43	
			0 2540		mg/l	mg/l	
00212	Total Dissolved Sol	ids		n.a.	636	60.0	1
		CIM 2	0 3500	Fo D	mg/l	mg/l	
			ified	re b	mg/ 1	g/ 1	
08344	Ferrous Iron	moa.	IIIea	n.a.	40.0	10.0	100
00344	relious lion			II.a.	40.0	10.0	100
		SM2	0 5210	В	mg/l	mg/l	
00235	Biochemical Oxygen			n.a.	25.8	3.0	1
	The holding time wa outside of the hold			The sample was s	submitted to the laboratory		
Microb	oiology	SM2	0 9215	В	cfu/mL	cfu/mL	
06157	~.	ia in	Water	n.a.	< 10,000	10,000	1
	Samples were analyz Standard Methods fo	ed us: r the	ing a mo Examina	odification of tation of tation of Water a	on 6/04/10 at 11:33. The technique outlined in and Wastewater, 20th ount, Pour Plate Method' p		
00307	source (hexadecane) and incubating the in the Retec Labora	to the plates tory before the tory before the total to th	he growt s for 7- Method ‡ ions hav	th system in a m 9 days. These m \$510, dated Janu	roduction of a sole carbon minimal salts agar medium modifications are outlined mary 22, 1991. No validationed by this laboratory. 780,000	1	n.a.



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Page 2 of 2

Sample Description: S-117 060110 Grab Water

Philadelphia Refinery 26th St. South

COC: 230370 S-117 060110

LLI Sample # WW 5997033 LLI Group # 1197217 Account # 10132

Project Name: SUN: Philadelphia Refinery 26th Street South

Collected: 06/01/2010 16:00 by JRW SUN: Aquaterra Tech.

PO Box 744

West Chester PA 19381

Submitted: 06/03/2010 17:50 Reported: 06/17/2010 16:18

Discard: 08/17/2010

117S-

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	10165196601B	06/16/2010	13:38	Ashley M Adams	20
00220	Nitrate Nitrogen	EPA 353.2	1	10161106101A	06/10/2010	19:43	Venia B McFadden	1
00219	Nitrite Nitrogen	EPA 353.2	1	10154105103A	06/03/2010	21:14	Joseph E McKenzie	1
01550	Total Carbon	EPA 415.1	1	10159049501A	06/08/2010	01:05	James S Mathiot	5
00273	Total Organic Carbon	SM20 5310 C	1	10158049502A	06/07/2010	02:40	James S Mathiot	1
00202	Alkalinity to pH 4.5	SM20 2320 B	1	10155020201B	06/04/2010	12:37	Geraldine C Smith	1
00201	Alkalinity to pH 8.3	SM20 2320 B	1	10155020201B	06/04/2010	12:37	Geraldine C Smith	1
00212	Total Dissolved Solids	SM20 2540 C	1	10155021201B	06/04/2010	09:25	Susan E Hibner	1
08344	Ferrous Iron	SM20 3500 Fe B modified	1	10155834401A	06/04/2010	01:05	Daniel S Smith	100
00235	Biochemical Oxygen Demand	SM20 5210 B	1	10155023502A	06/04/2010	10:10	Hannah M Royer	1
06157	HC Degrading Bacteria in Water	SM20 9215 B	1	060410KS	06/11/2010	16:13	Kimberly A Small	1
00307	Heterotrophic Plate Count	SM20 9215 B	1	060310KAH	06/06/2010	09:45	Keith A Hoover	n.a.



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Quality Control Summary

Client Name: SUN: Aquaterra Tech. Group Number: 1197217

Reported: 06/17/10 at 04:18 PM

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method

Laboratory Compliance Quality Control

Analysis Name	Blank <u>Result</u>	Blank <u>LOO</u>	Report <u>Units</u>	LCS %REC	LCSD %REC	LCS/LCSD <u>Limits</u>	RPD	RPD Max
Batch number: 10154105103A Nitrite Nitrogen	Sample numbe < 0.050	er(s): 599 0.050	7029-5997(mg/l)33 99		90-110		
Batch number: 10158049502A Total Organic Carbon	Sample numbe	er(s): 599 1.0	7029-5997(mg/l)33 94		91-113		
Batch number: 10159049501A Total Carbon	Sample numbe	er(s): 599 1.0	7029-5997(mg/l	033 107		80-120		
Batch number: 10161106101A Nitrate Nitrogen	Sample numbe < 0.10	er(s): 599 0.10	7029-5997(mg/l	033 102		90-110		
Batch number: 10165196601B Sulfate	Sample numbe		7029-5997(mg/l	033 105		89-110		
Batch number: 10155020201B Alkalinity to pH 4.5	Sample numbe < 2.0	er(s): 599 2.0	7029-59970 mg/l as CaCO3			98-103		
Batch number: 10155021201B Total Dissolved Solids	Sample numbe < 30.0	er(s): 599 30.0	7029-5997(mg/l	033 109		80-120		
Batch number: 10155023502A Biochemical Oxygen Demand	Sample numbe	er(s): 599	7029-5997()33 98	99	85-115	1	8
Batch number: 10155834401A Ferrous Iron	Sample numbe < 0.10	er(s): 599 0.10	7029-5997(mg/l)33 98		92-105		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS <u>%REC</u>	MSD <u>%REC</u>	MS/MSD <u>Limits</u>	RPD	RPD <u>MAX</u>	BKG Conc	DUP Conc	DUP <u>RPD</u>	Dup RPD <u>Max</u>
Batch number: 10154105103A Nitrite Nitrogen	Sample 81*	number(s)	: 5997029 90-110	-599703	3 UNSPR	C: P997106 0.14	BKG: P997106 0.13	4 (1)	20
Batch number: 10158049502A Total Organic Carbon	Sample 97	number(s)	: 5997029 64-141	-599703	3 UNSPR	C: P997100 4.8	BKG: P997100 5.0	5* (1)	4
Batch number: 10159049501A Total Carbon	Sample 84	number(s)	: 5997029- 72-132	-599703	3 UNSP	: 5997033 150	BKG: 5997033	3	20

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



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Quality Control Summary

Client Name: SUN: Aquaterra Tech. Group Number: 1197217

Reported: 06/17/10 at 04:18 PM

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD <u>Limits</u>	RPD	RPD <u>MAX</u>	BKG Conc	DUP <u>Conc</u>	DUP RPD	Dup RPD <u>Max</u>
Batch number: 10161106101A Nitrate Nitrogen	Sample 99	number(s)	: 5997029 90-110	-599703	3 UNSPI	K: P997193 0.59	BKG: P997193 0.62	6*	2
Batch number: 10165196601B Sulfate	Sample 111*	number(s)	: 5997029 90-110	-599703	3 UNSPE	K: 5997029 8.9	BKG: 5997029 8.9	0 (1)	20
Batch number: 10155020201B Alkalinity to pH 4.5 Alkalinity to pH 8.3	Sample 97	number(s) 95	: 5997029 73-121		3 UNSPI 5	<pre>X: P996019 407 < 2.0</pre>	BKG: P994436 407 < 2.0	0 0 (1)	5 5
Batch number: 10155021201B Total Dissolved Solids	Sample 104	number(s)	: 5997029 62-135	-599703	3 UNSPI	K: P996697 10,700	BKG: P993653 10,900	2	9
Batch number: 10155023502A Biochemical Oxygen Demand	Sample 113	number(s) 121	: 5997029 76-134		3 UNSPI 8	K: 5997029 34.1	BKG: 5997031	1	15
Batch number: 10155834401A Ferrous Iron	Sample 95	number(s) 97	: 5997029 73-120	-599703 1	3 UNSPI 6	K: P990732 9.1	BKG: P990732 8.9	2 (1)	5

^{*-} Outside of specification

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

Analysis Request/ Environmental Services Chain of Custody



Lancaster Laboratories	Acct. # 10) 32 c	I Grou pi structi	or Lan	caster L 72(72) reverse	aborati	ories u ample orrespo	se only #_S	9 9 7 n circle	9 17	6 - 3 bers.	8		(C)370)
1) Client: Apus terra Technologies Inc	Acct. #:				Matri)	<u>(</u>	5) A Pre	n alys serva	33,700,000,000		3632243			For Lab Use Only FSC: SCR#:		
Project Name/#: Phills Relines 265t Sa Project Manager: Tiffani Doe!	P.O.#: _	#:		- -	e Check II S. Acolicates		en Ocmand	storia in the				Usi	PH 4.5	'n	ic Callor	Preservation Codes H=HCl T=Thiosu N=HNO ₃ B=NaOH S=H ₂ SO ₄ O=Other	lfate	6
Sampler: IR Williams Name of state where samples were collected:			3	Southe	Hatel L		الإصابحة	Cading Bu	100Em	Total Carbon	ate	te Nifegen	Alkalinity to PH	te Nitraga	logeni	*Lab filters Samples		lune of samples saint (if requeste
Sample Identification	Date Collected	Time Gollected	8	Tues S	į	Office	8 10 Ct	7 X		Total	sulfate	Nitigte	Alka	NAC	Tota	Remarks		
5-52-060110 5-50-060110	6/1/10	1000	X		X X	11	- '`	, X X	X	X	X	X X	X	X	X	temp 1.2	-Z.4	190
5-231-060110 5-232-060110	6/1/10	1340 1450	X		X	11	'''	X	X	X	X X	X	X A	X X		Ok to nun and past hold per		8
5-117_060110	6/1/10	1600	X		X	11	1.	X	X	X	X	X	X	X	X X		Afric Le	14/10
Turnaround Time Requested (TAT) (please of (Rush TAT is subject to Lancaster Laboratories applications)		-		Reling	dished	by:			<u> </u>	Dat 6/2//		Time	ſ		d by: 	Fildge		Time (9
Date results are needed: Rush results requested by (please circle): Phone #: E-mail address:	hone Fax	E-mail		Sh	uished uished] 	/ <u>~</u>	1	5	Dat م۔ اور Dat	0/	Time //:プロ Time		Δ	**	gedes	6/3/10	Time
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Type III (Reduced NJ) Type IV (CLP SOW) Type VI (Raw Data Only) Site-specific QC ((If yes, indicate QC sample and sub-	mit triplicata volume.)			Relinq	uished	by:	<u>.</u>	\		Dat	e	Time	Rec	eive	d by:	= G3	Date	Time



Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL N.D.	Reporting Limit none detected	BMQL MPN	Below Minimum Quantitation Level Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
С	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
ug	microgram(s)	mg	milligram(s)
ml	milliliter(s)	I	liter(s)
m3	cubic meter(s)	ul	microliter(s)

- < less than The number following the sign is the <u>limit of quantitation</u>, the smallest amount of analyte which can be reliably determined using this specific test.
- > greater than
- J estimated value The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).
- ppm parts per million One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

Increasic Ovelitions

ppb parts per billion

Dry weightbasis
Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

U.S. EPA CLP Data Qualifiers:

	Organic Qualifiers		Inorganic Qualifiers
Α	TIC is a possible aldol-condensation product	В	Value is <crdl, but="" th="" ≥idl<=""></crdl,>
В	Analyte was also detected in the blank	E	Estimated due to interference
С	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
Ε	Concentration exceeds the calibration range of	S	Method of standard additions (MSA) used
	the instrument		for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
Р	Concentration difference between primary and	W	Post digestion spike out of control limits
	confirmation columns >25%	*	Duplicate analysis not within control limits
U	Compound was not detected	+	Correlation coefficient for MSA < 0.995
X,Y,Z	Defined in case narrative		

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Ormania Ovalitiana

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

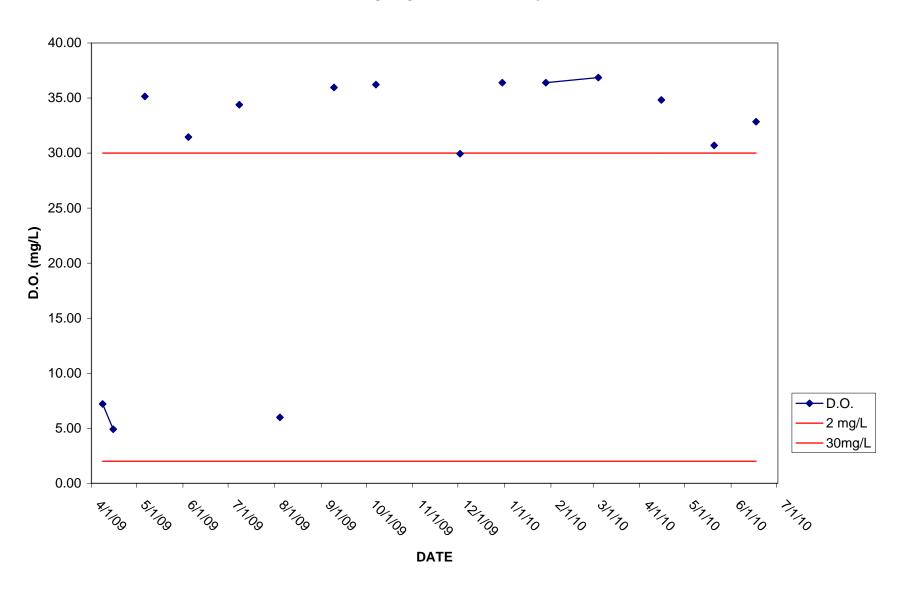
WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL LANCASTER LABORATORIES BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF LANCASTER LABORATORIES AND (B) WHETHER LANCASTER LABORATORIES HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Lancaster Laboratories which includes any conditions that vary from the Standard Terms and Conditions, and Lancaster hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



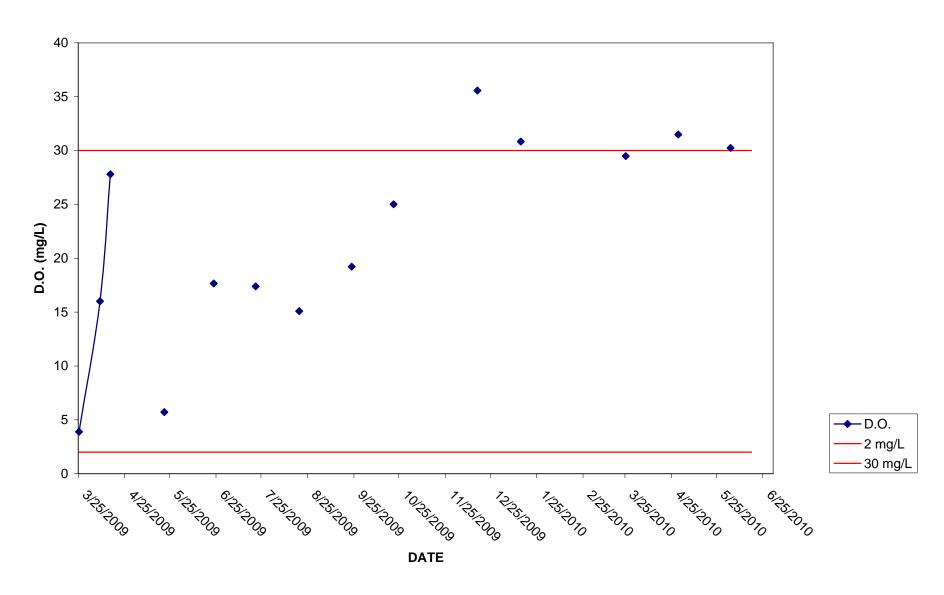
ATTACHMENT B

DO Graphs for System Wells

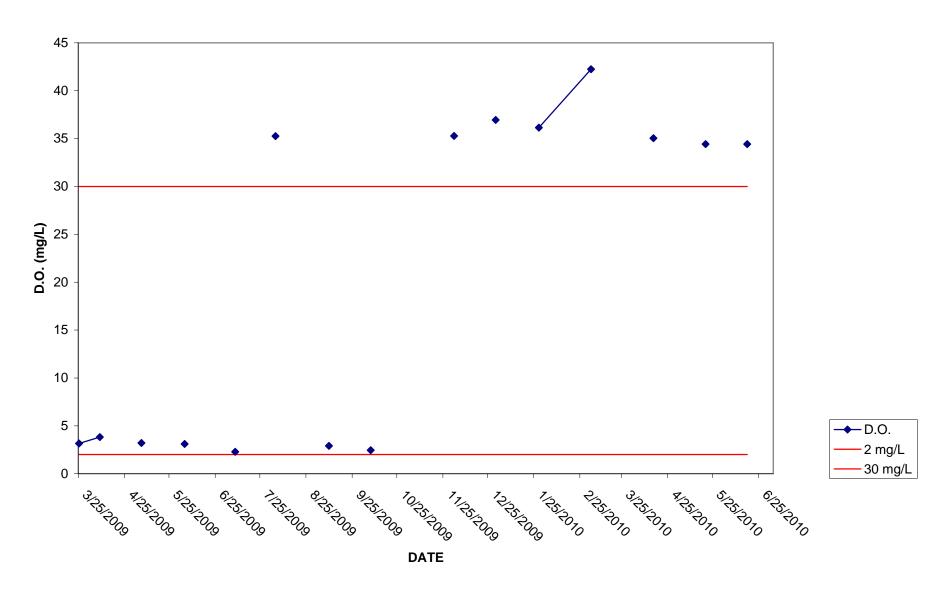
IW-1S D.O. FIELD DATA vs TIME



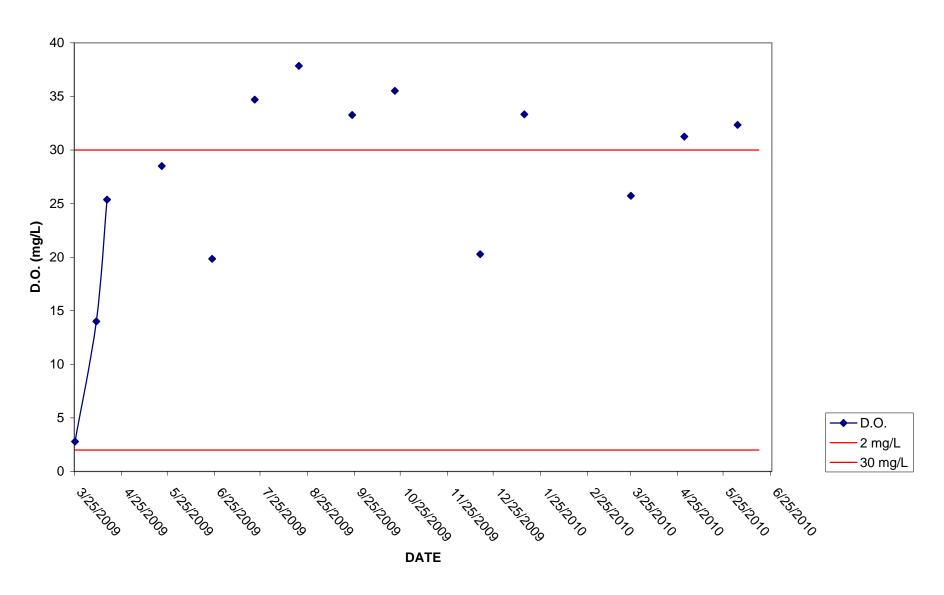
IW-2S D.O. FIELD DATA vs TIME



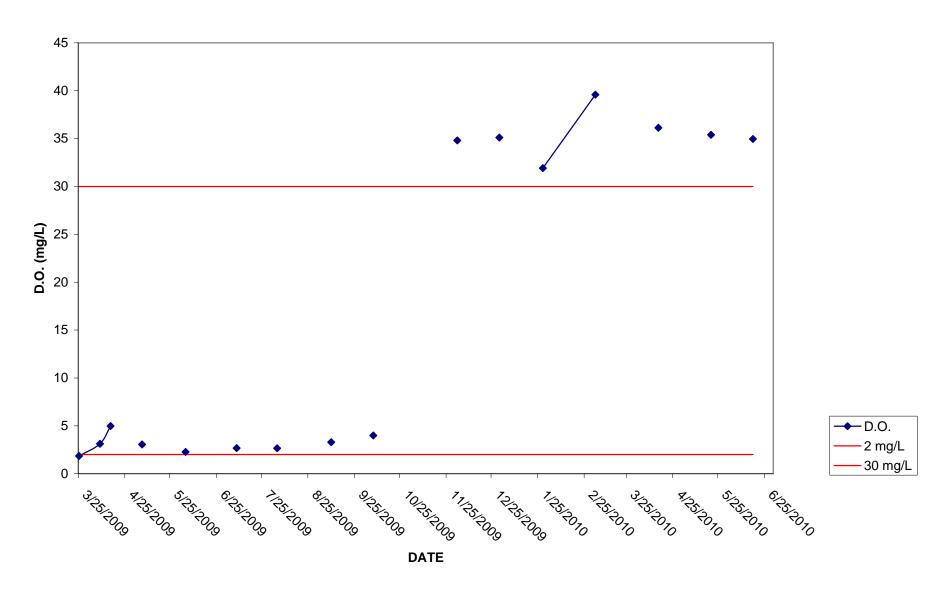
IW-3S D.O. FIELD DATA vs TIME



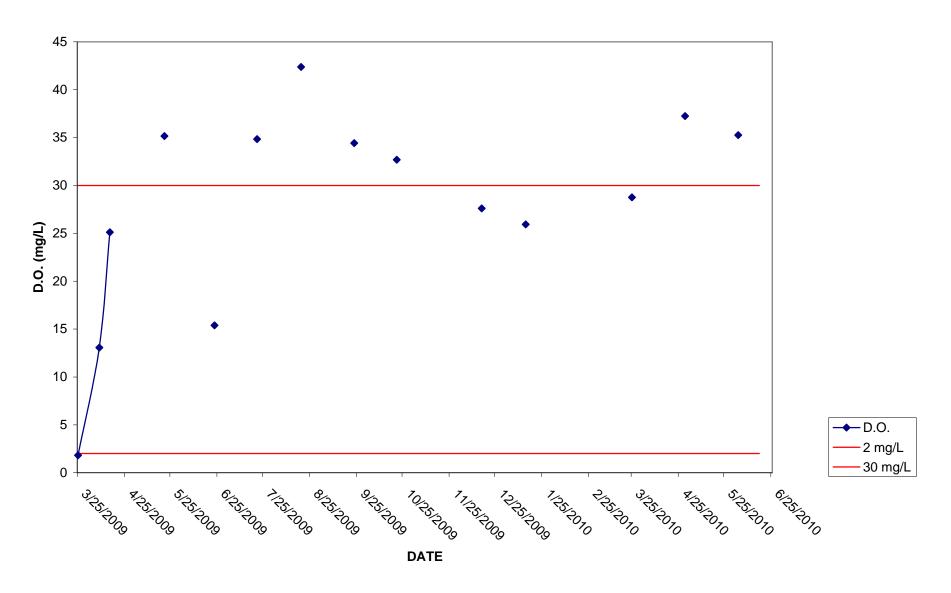
IW-4S D.O. FIELD DATA vs TIME



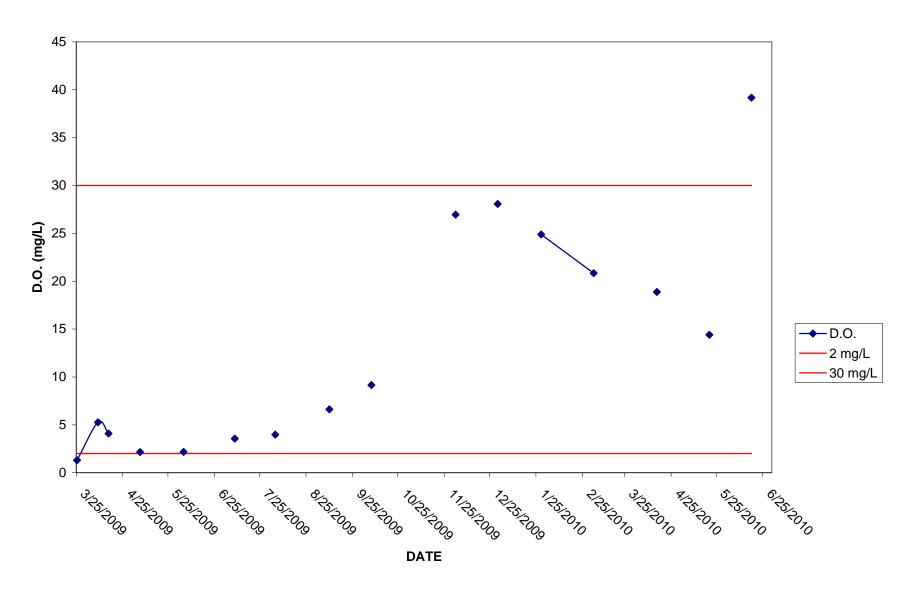
IW-5S D.O. FIELD DATA



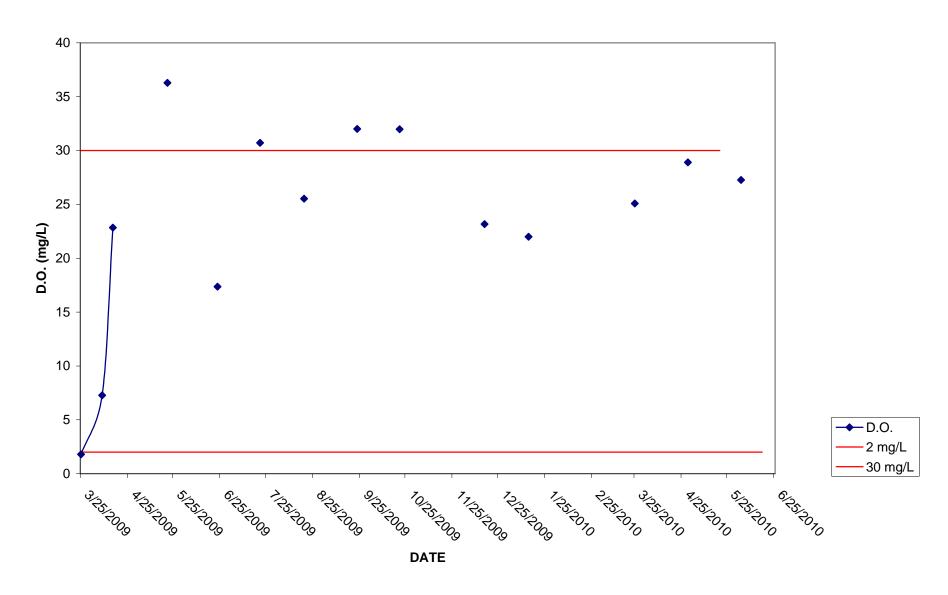
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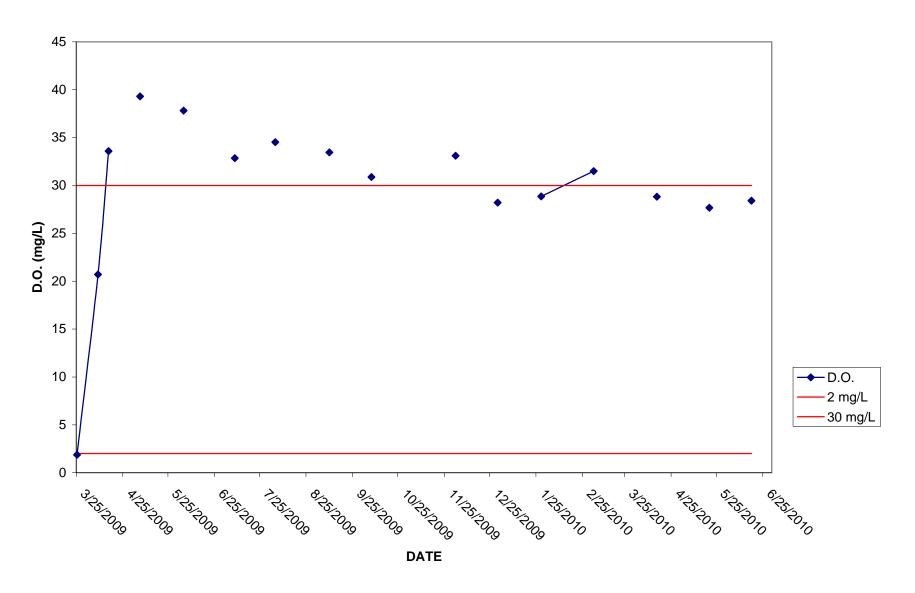
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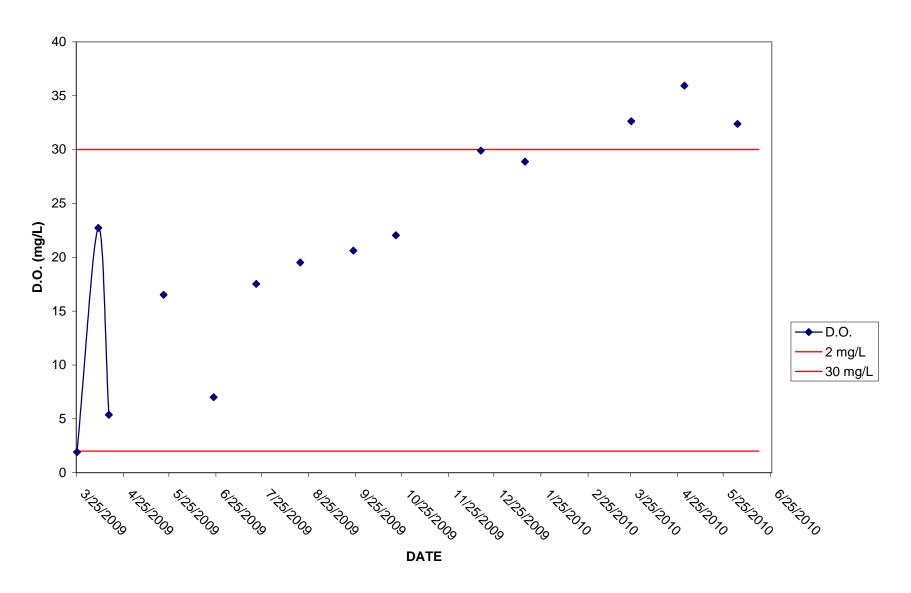
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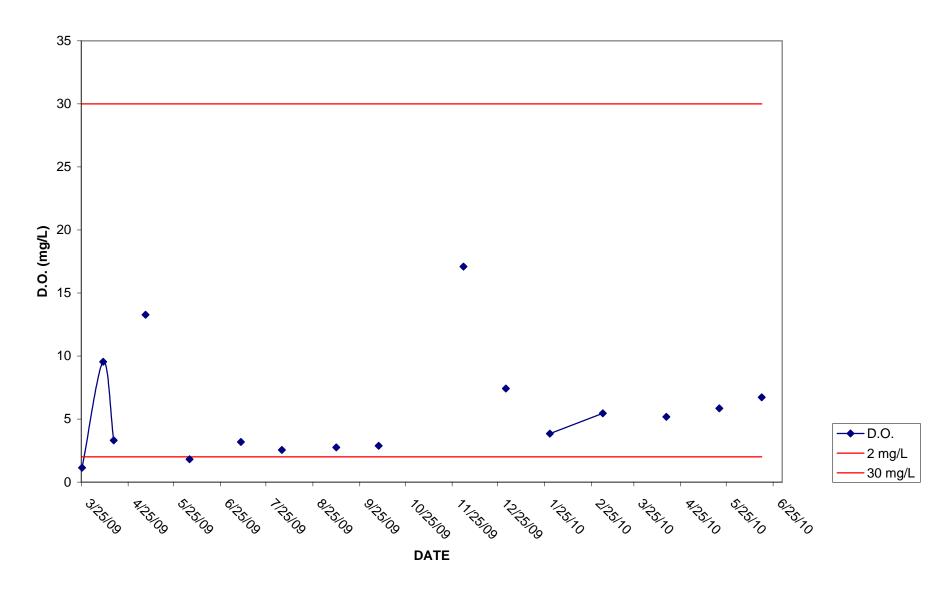
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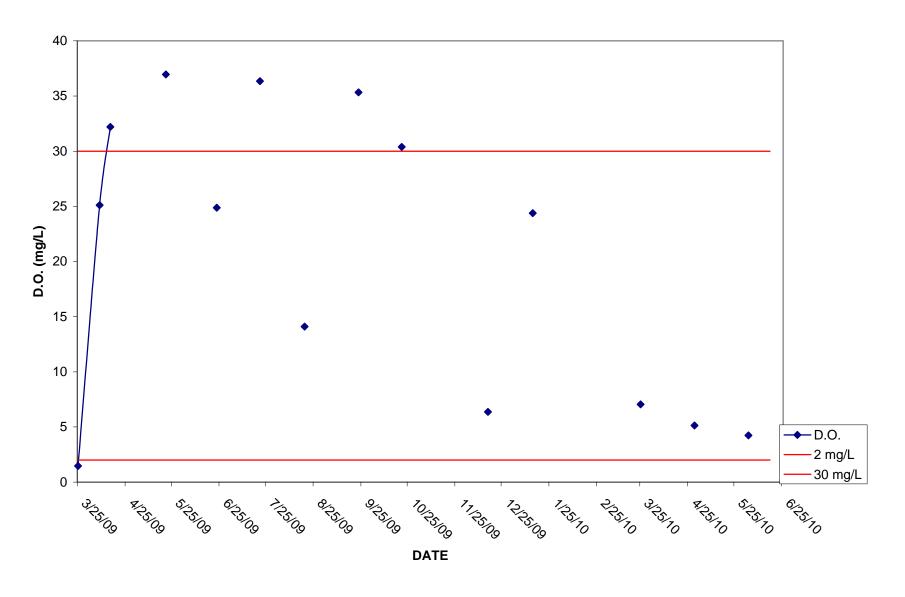
IW-10S D.O. FIELD DATA vs TIME



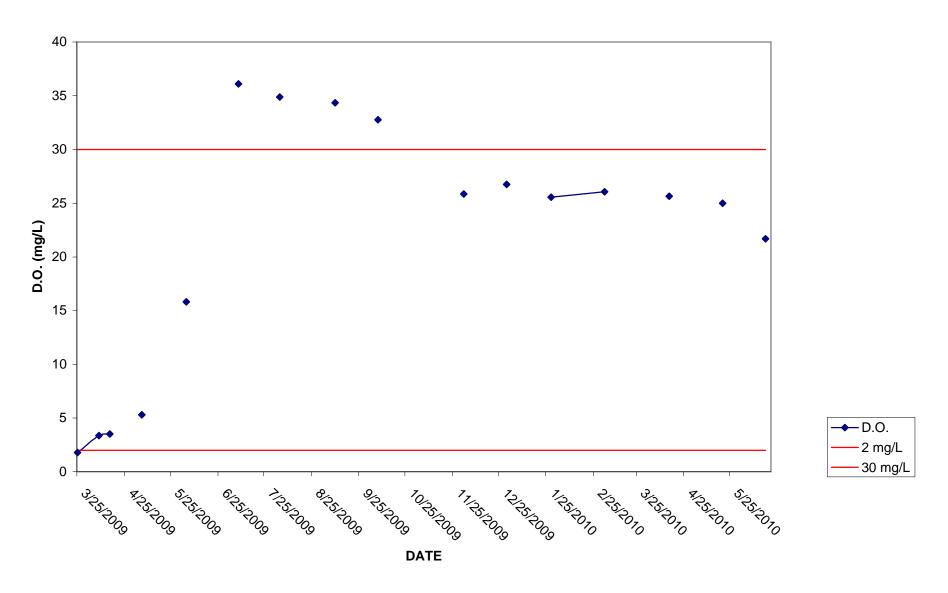
IW-11S D.O. FIELD DATA vs TIME



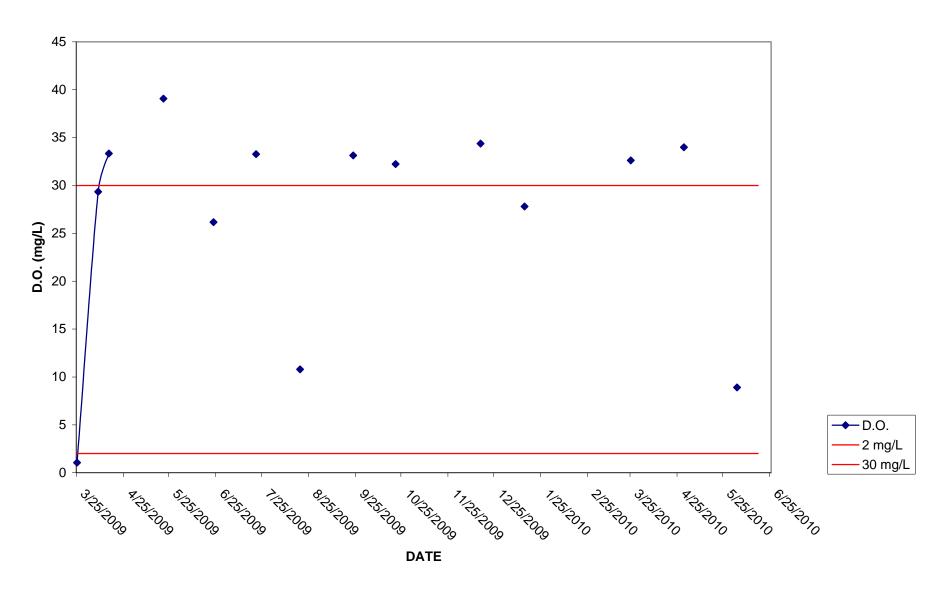
IW-12S D.O. FIELD DATA vs TIME



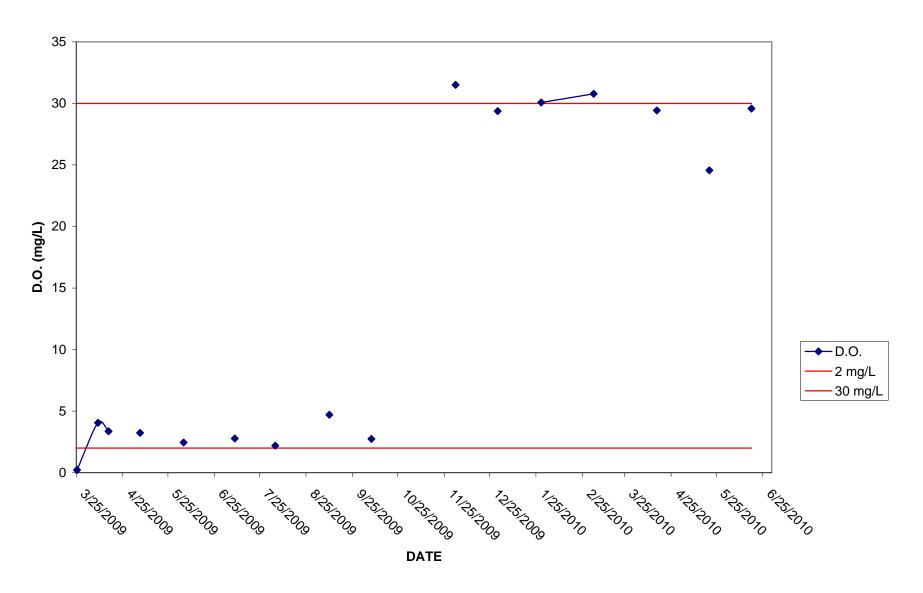
IW-13S D.O. FIELD DATA vs TIME



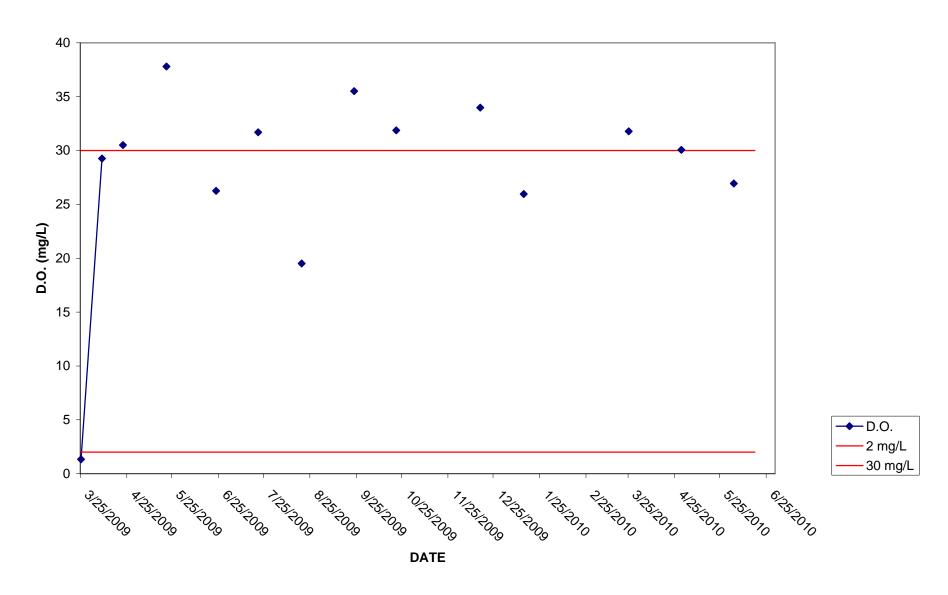
IW-14S D.O. FIELD DATA vs TIME



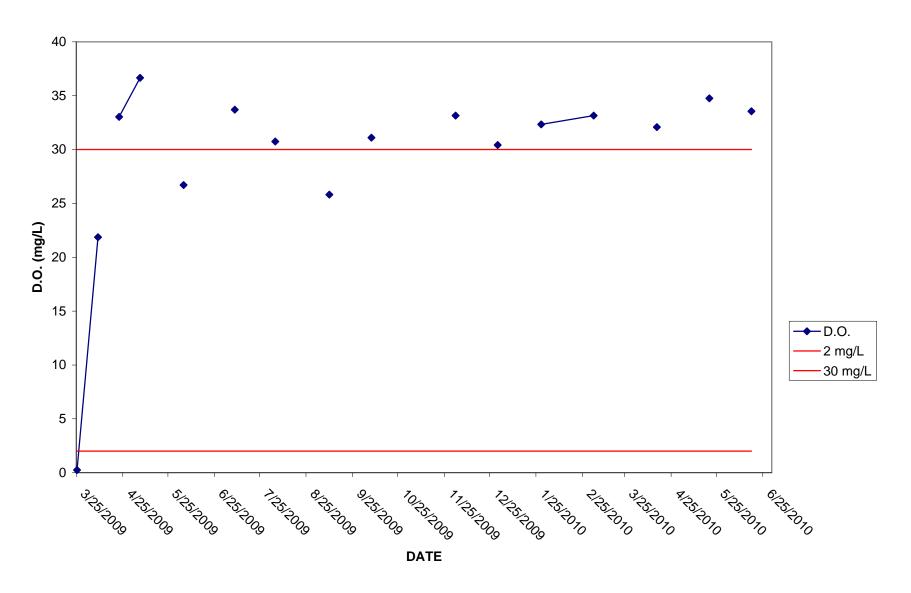
IW-15S D.O. FIELD DATA vs TIME



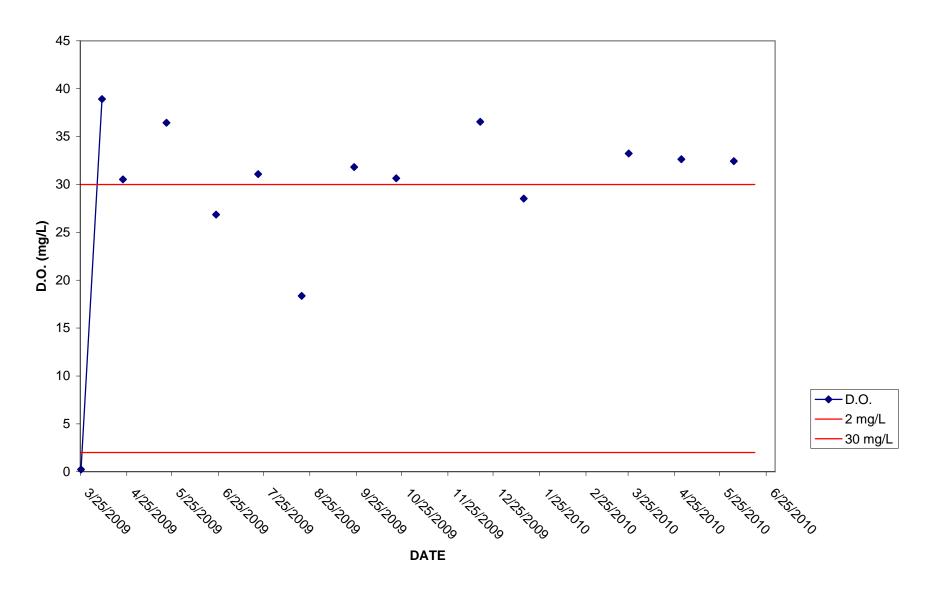
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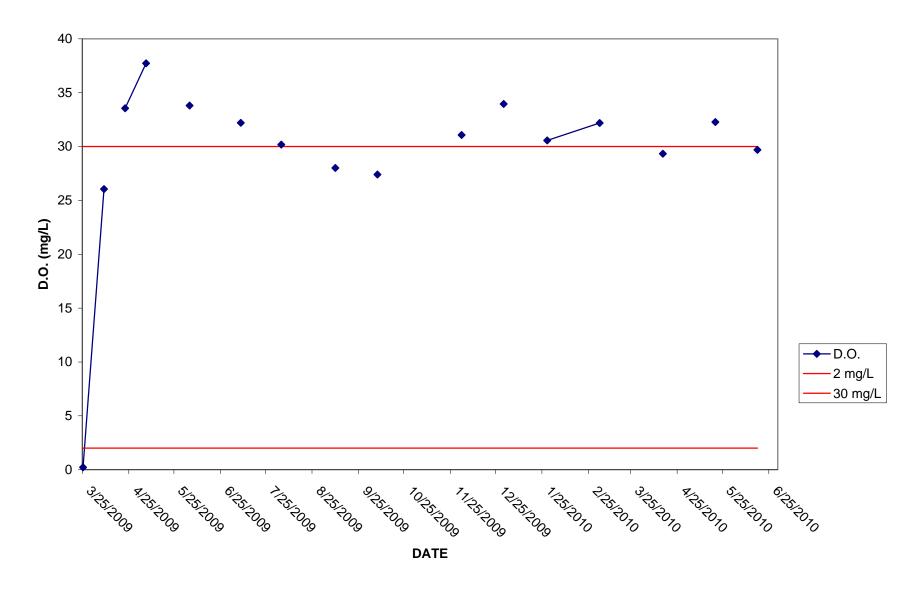
IW-17S D.O. FIELD DATA vs TIME



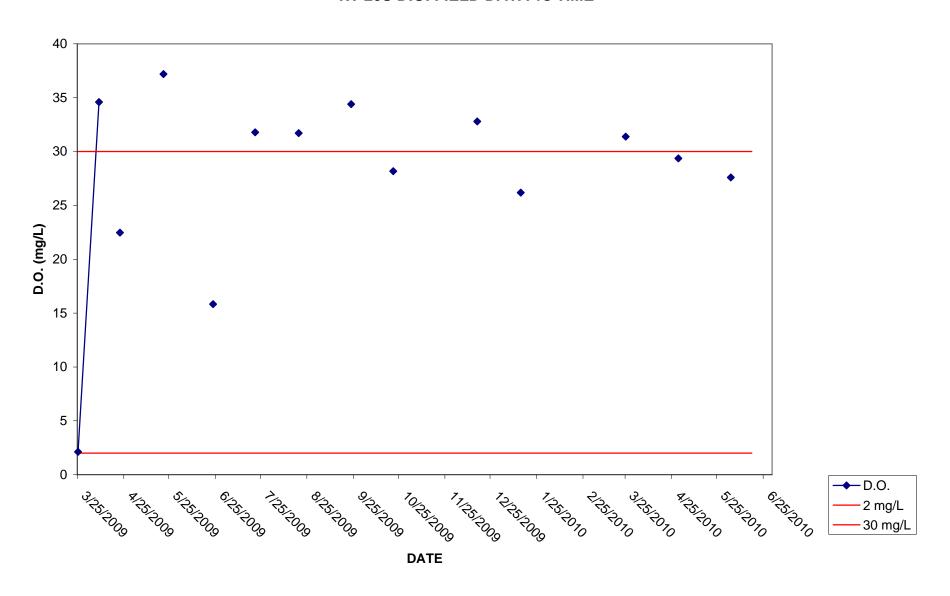
IW-18S D.O. FIELD DATA vs TIME



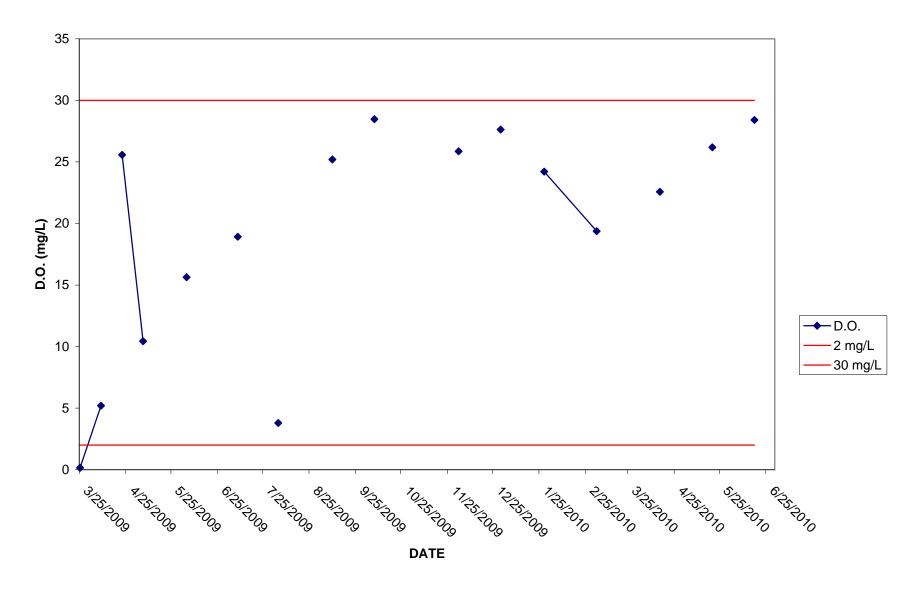
IW-19S D.O. FIELD DATA vs TIME



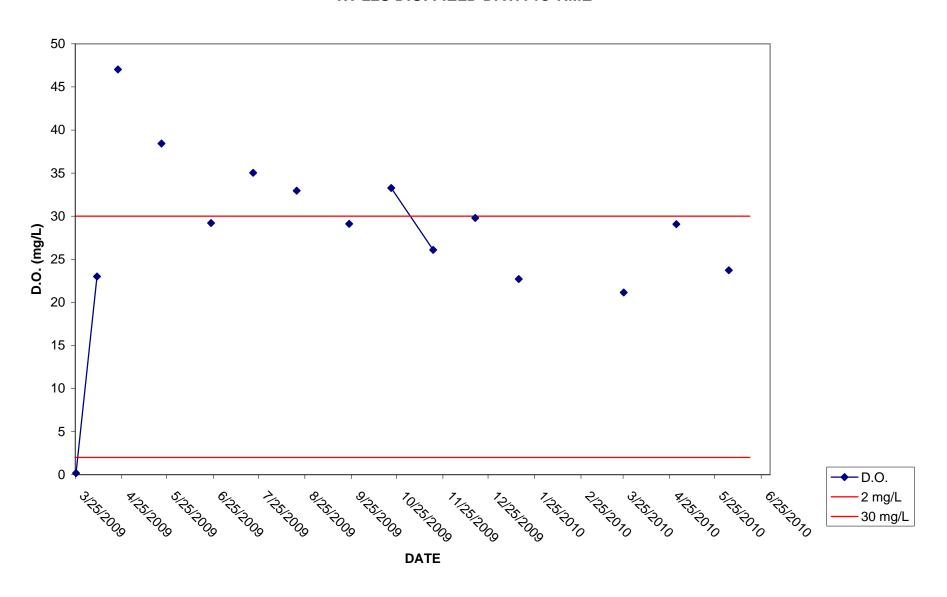
IW-20S D.O. FIELD DATA vs TIME



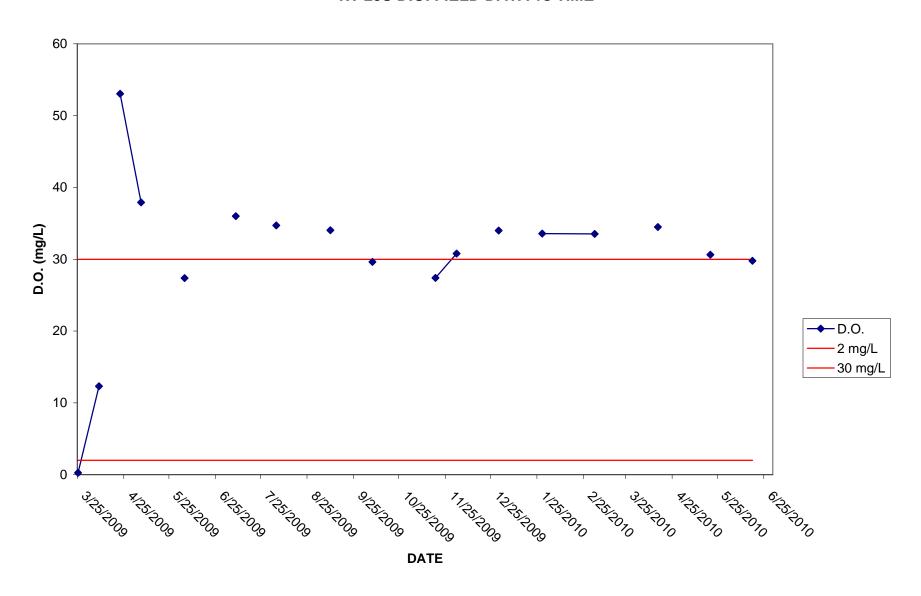
IW-21S D.O. FIELD DATA vs TIME



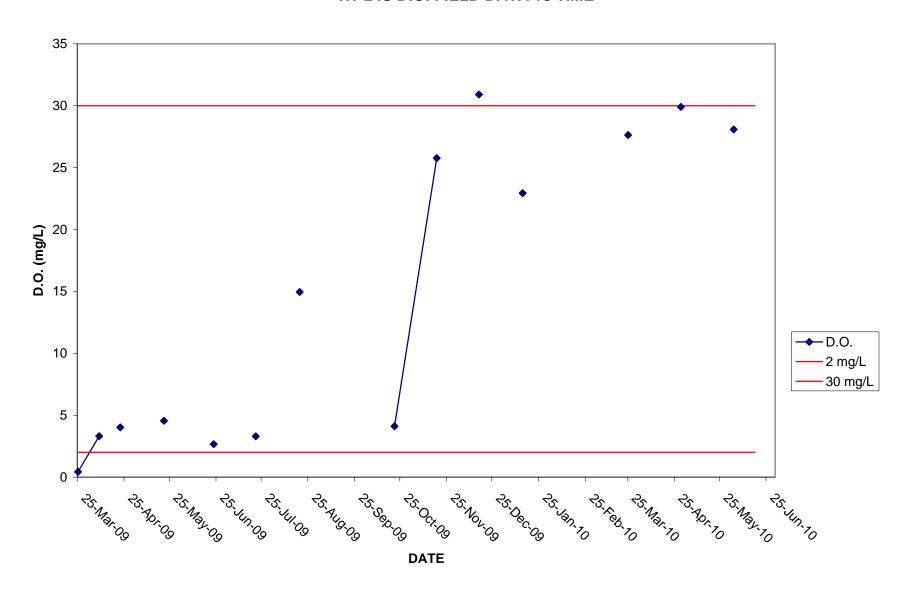
IW-22S D.O. FIELD DATA vs TIME



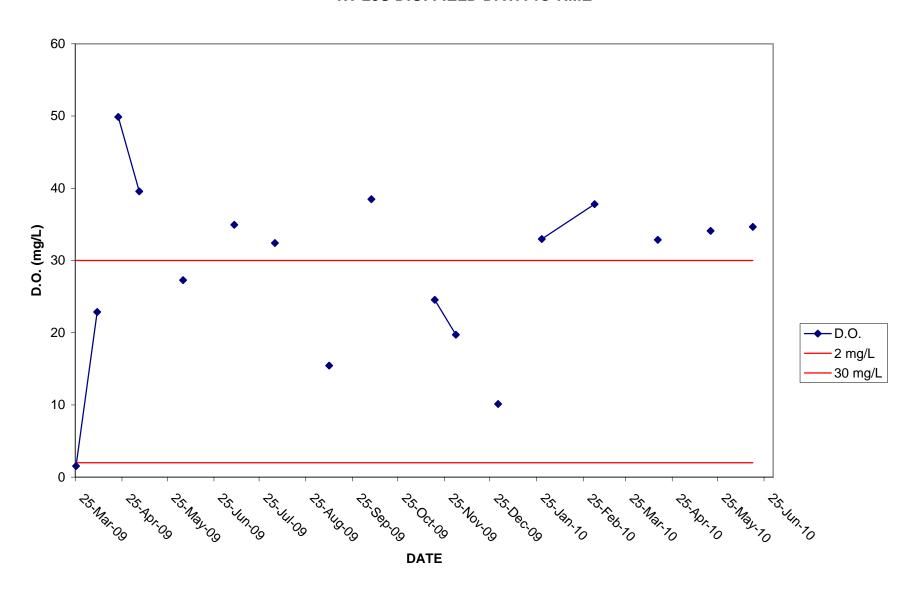
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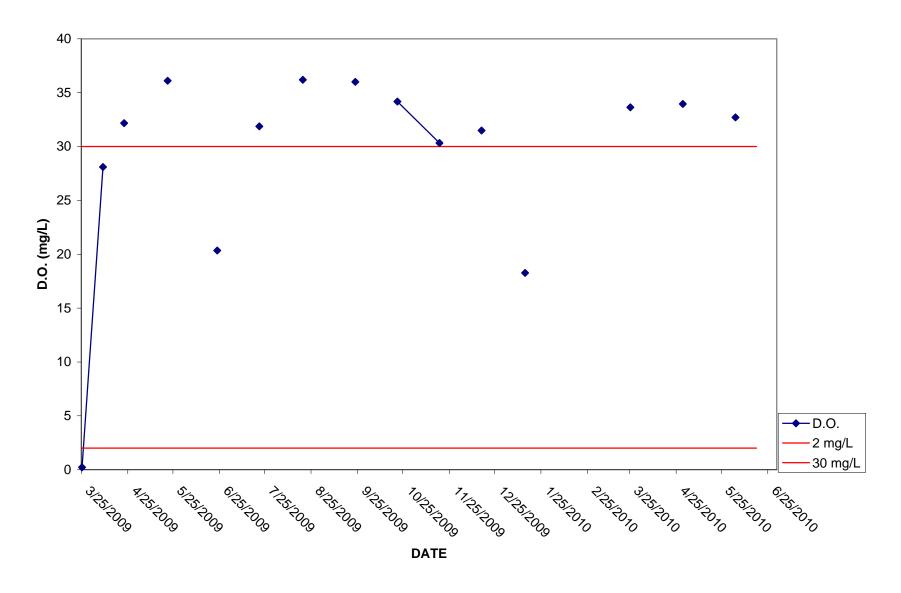
IW-24S D.O. FIELD DATA vs TIME



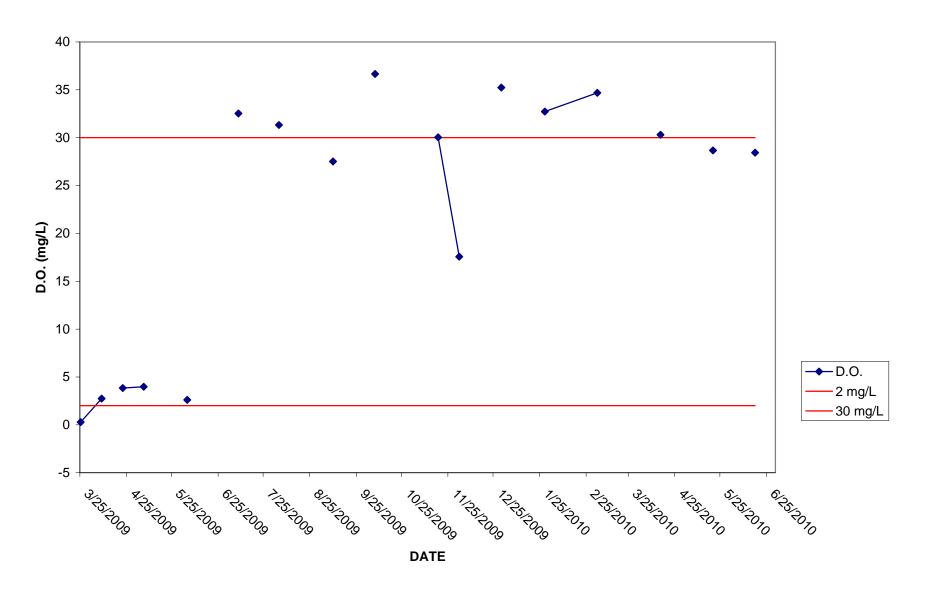
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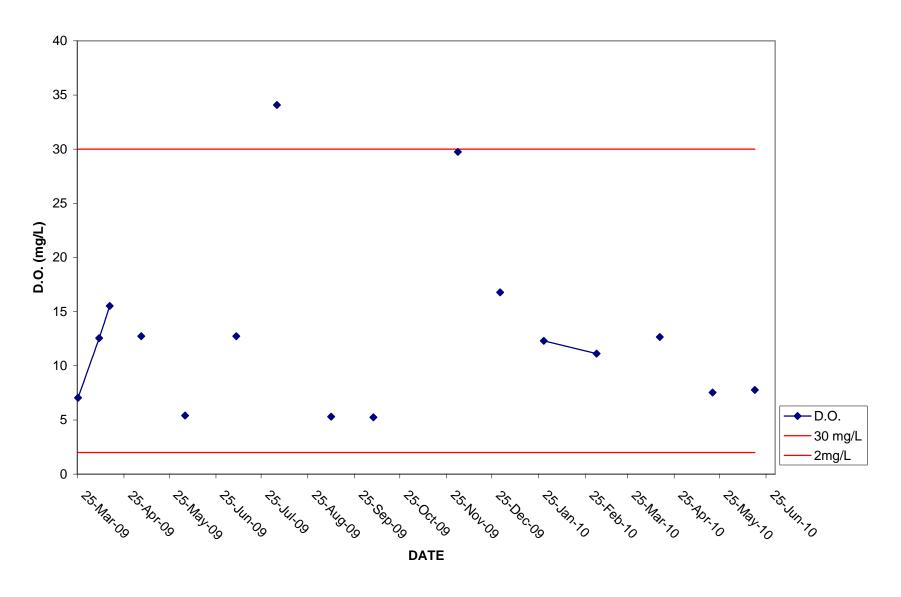
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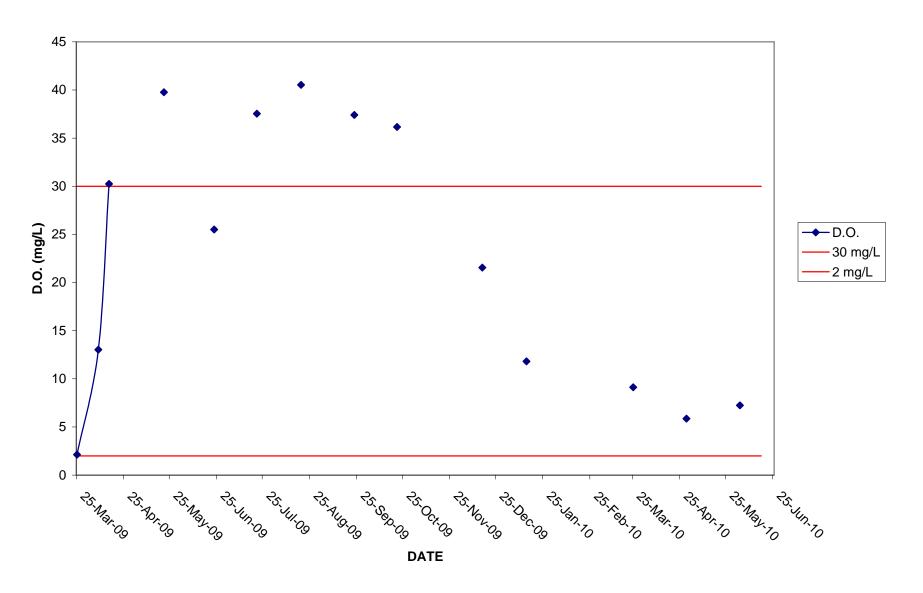
IW-27S D.O. FIELD DATA vs TIME



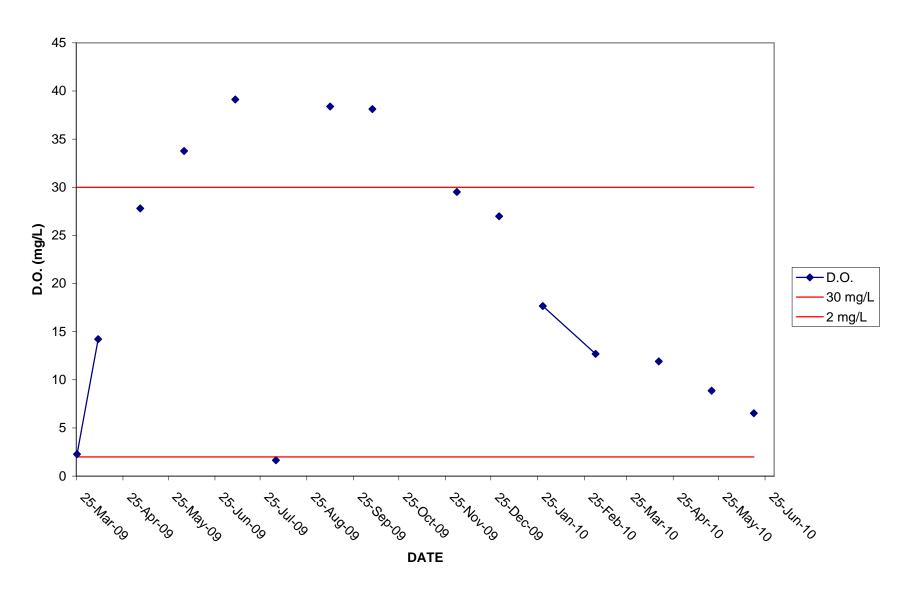
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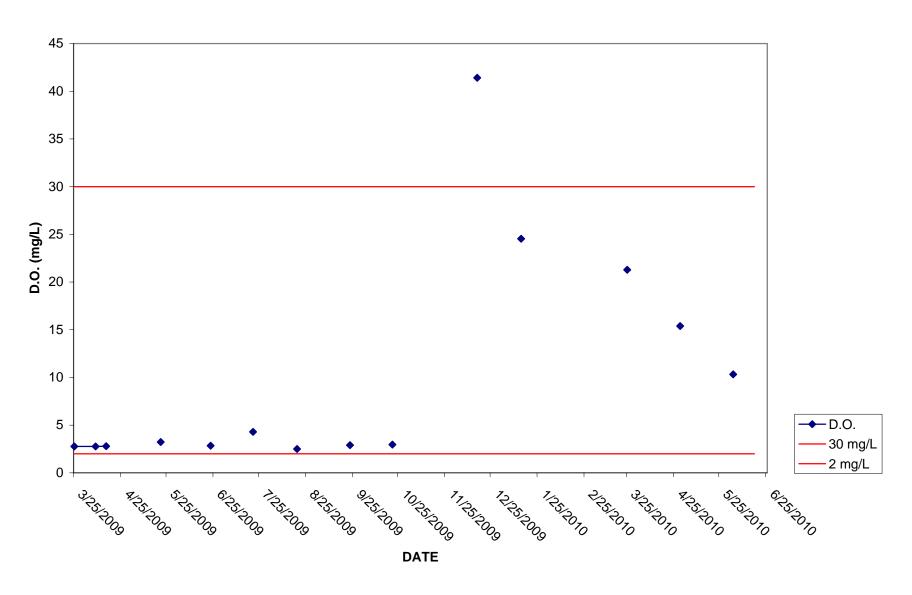
IW-2D D.O. FIELD DATA vs TIME



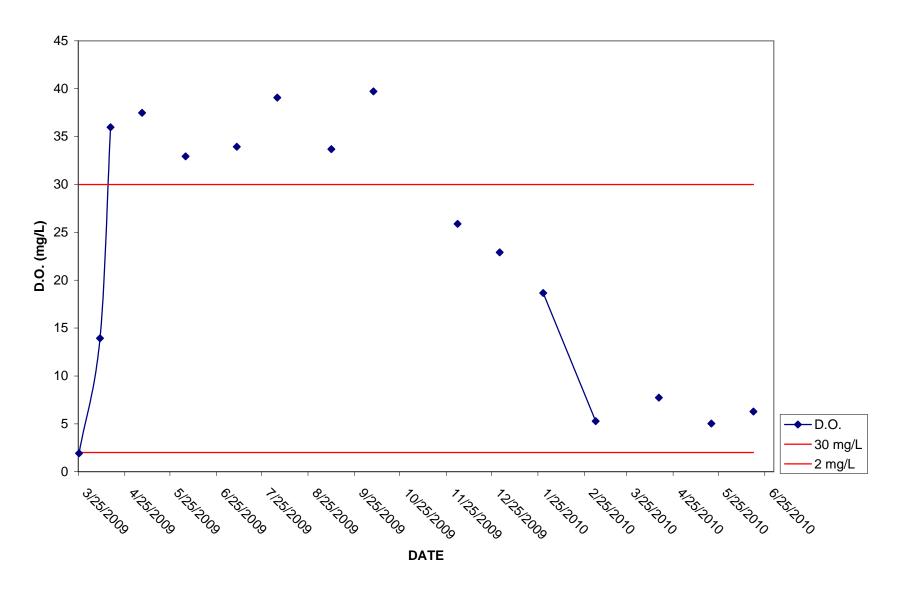
IW-3D D.O. FIELD DATA vs TIME



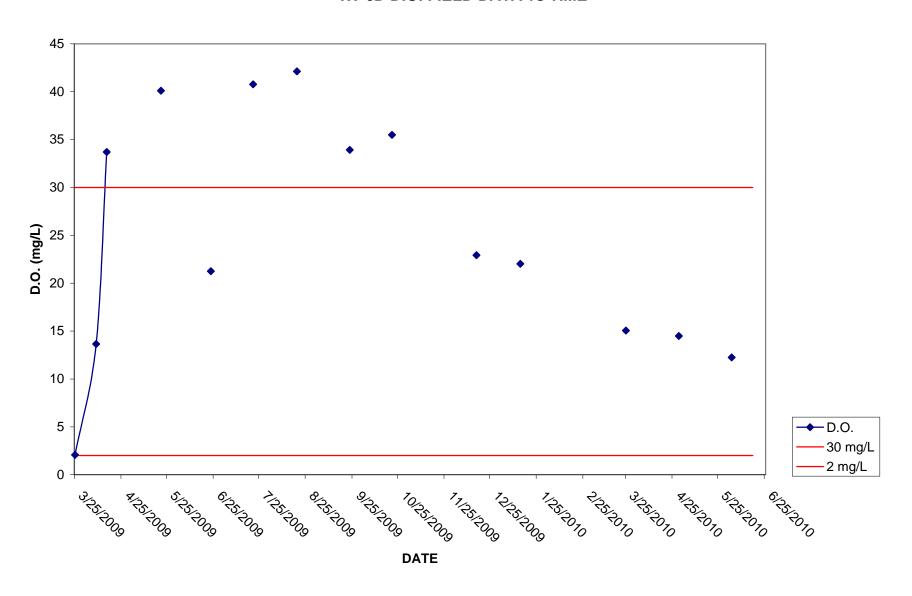
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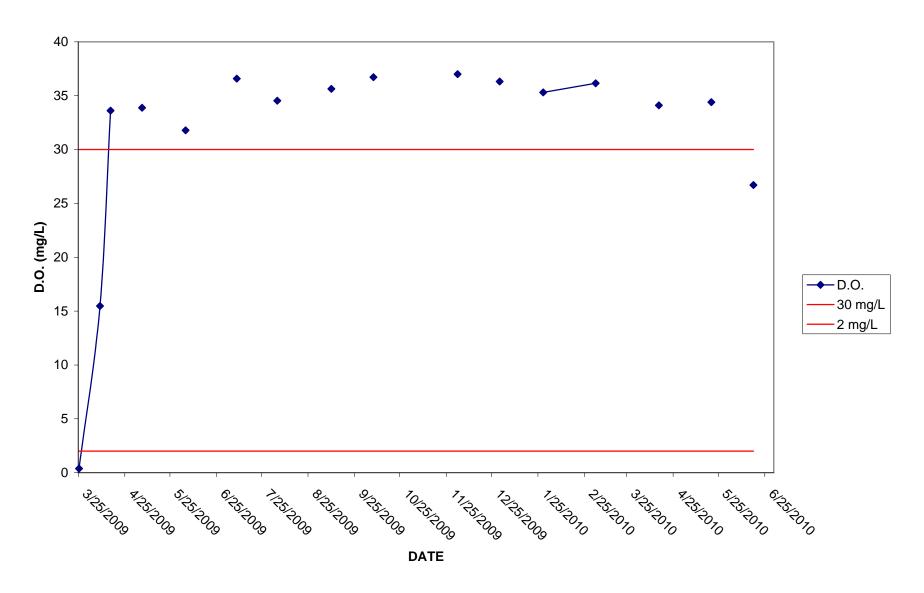
IW-5D D.O. vs TIME



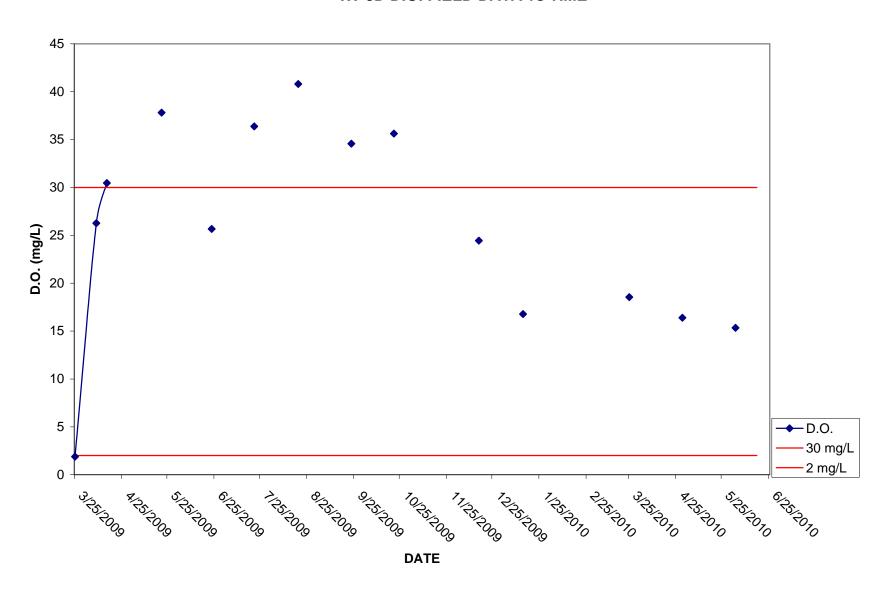
IW-6D D.O. FIELD DATA vs TIME



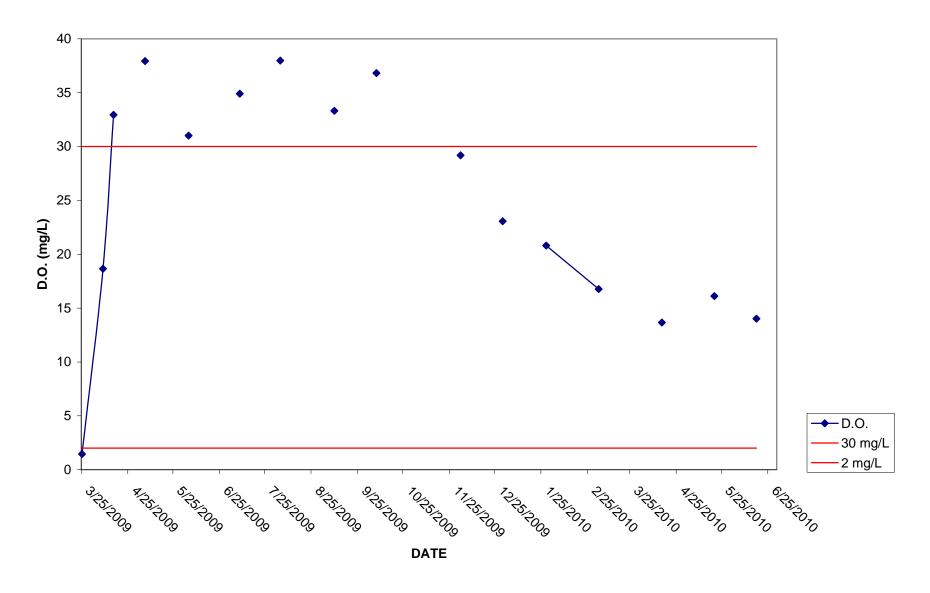
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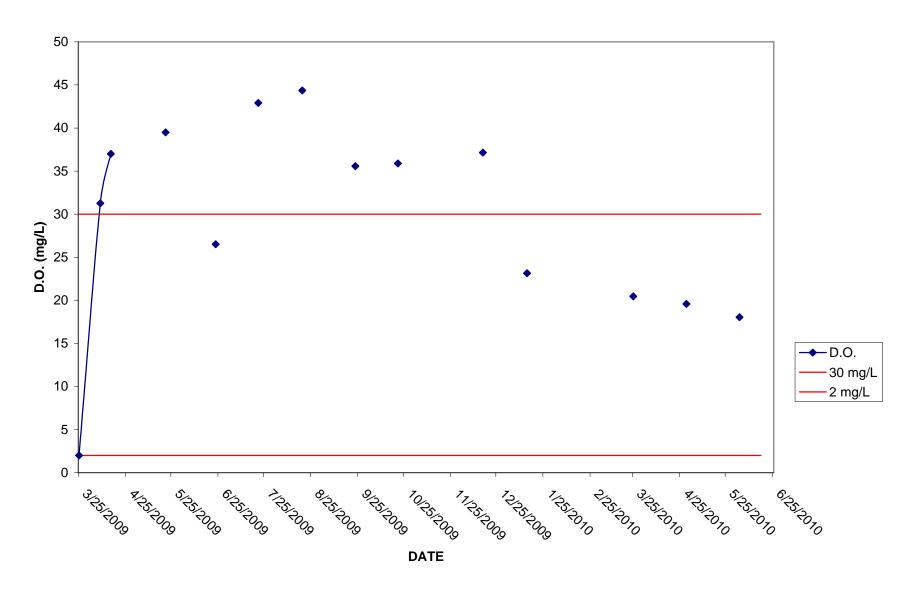
IW-8D D.O. FIELD DATA vs TIME



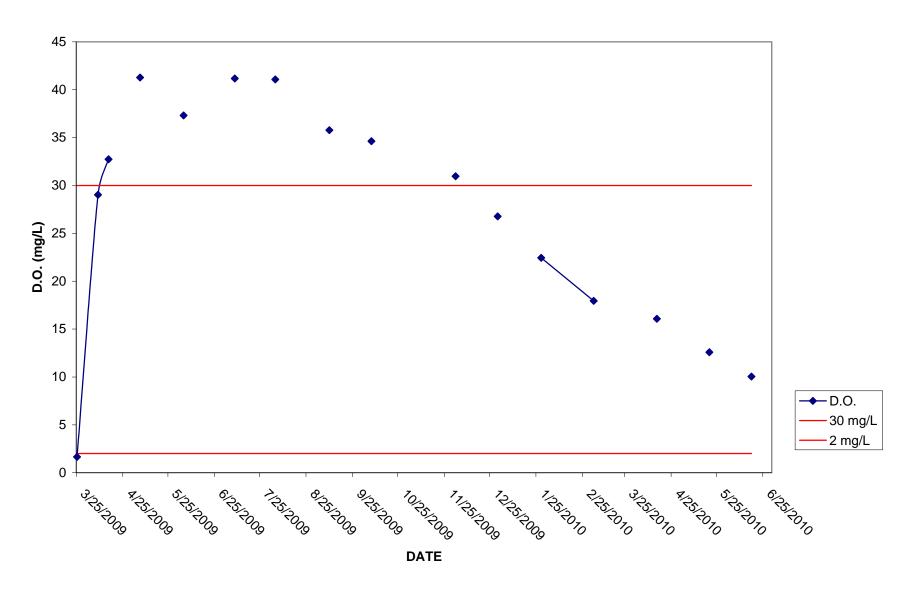
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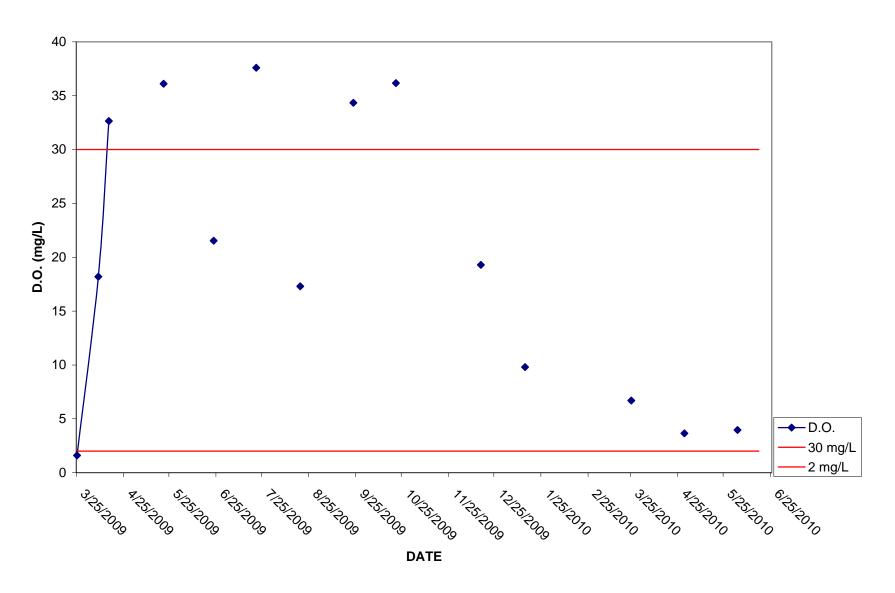
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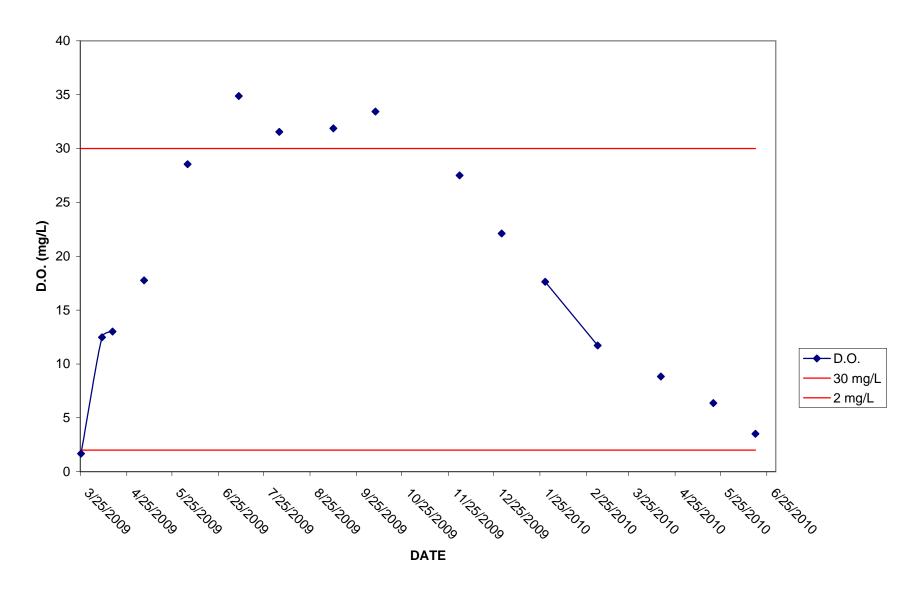
IW-11D D.O. FIELD DATA vs TIME



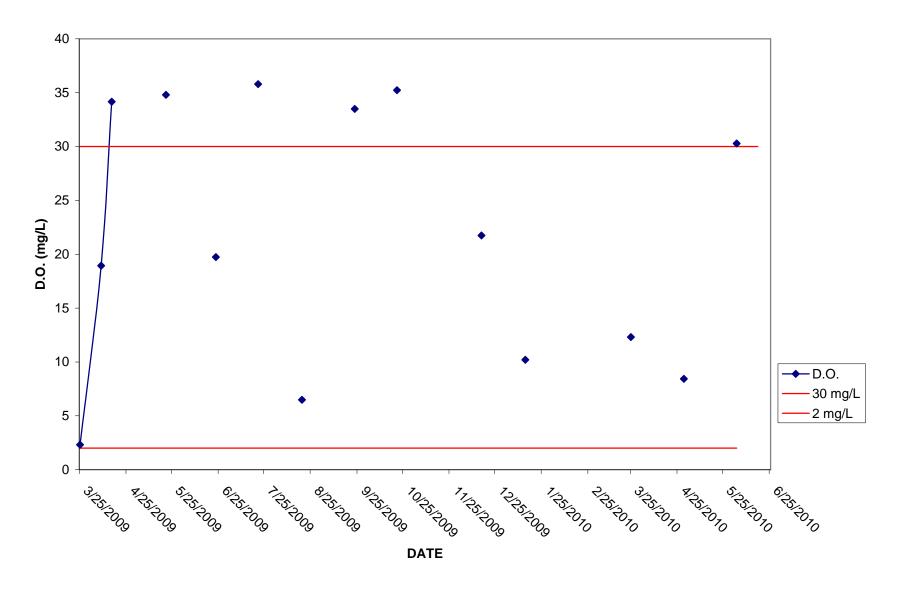
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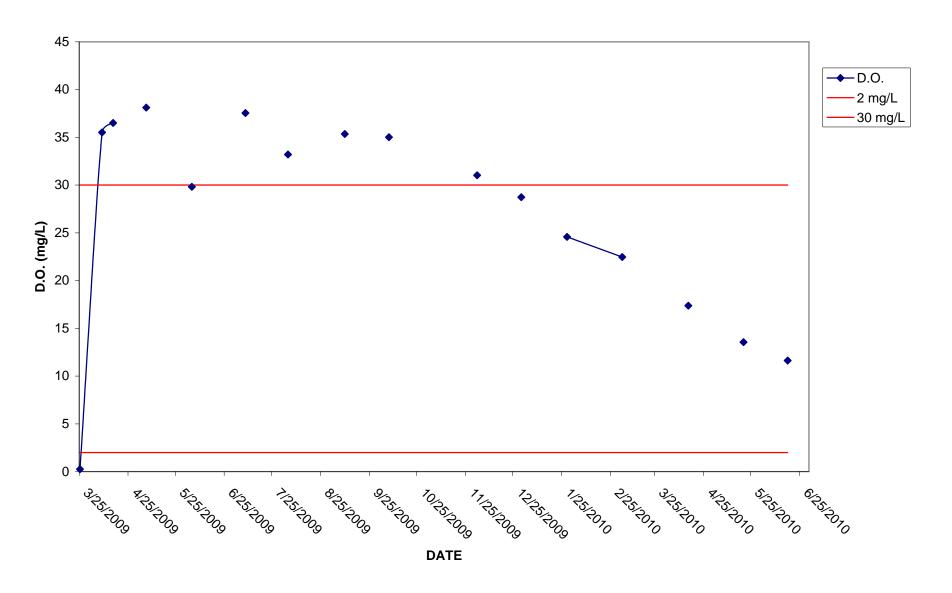
IW-13D D.O. FIELD DATA vs TIME



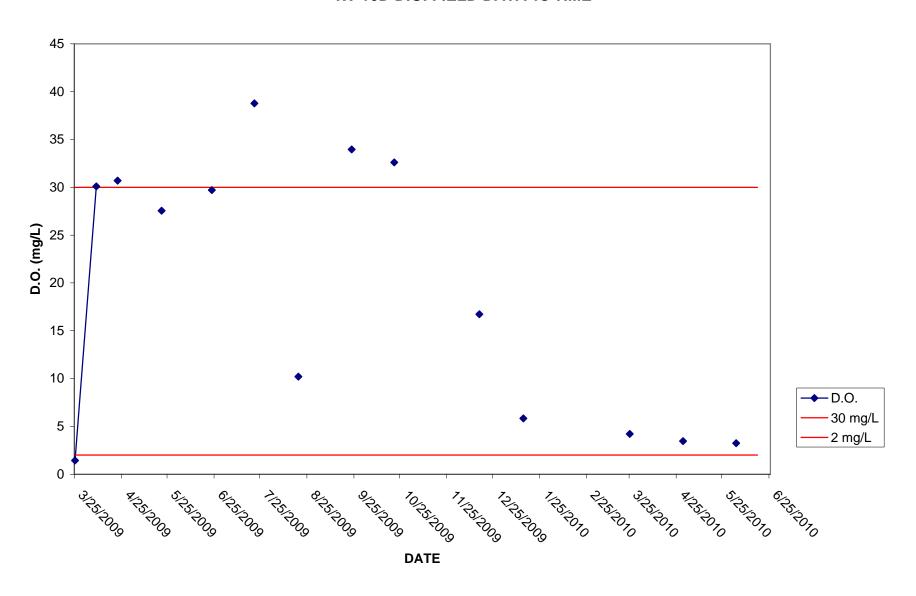
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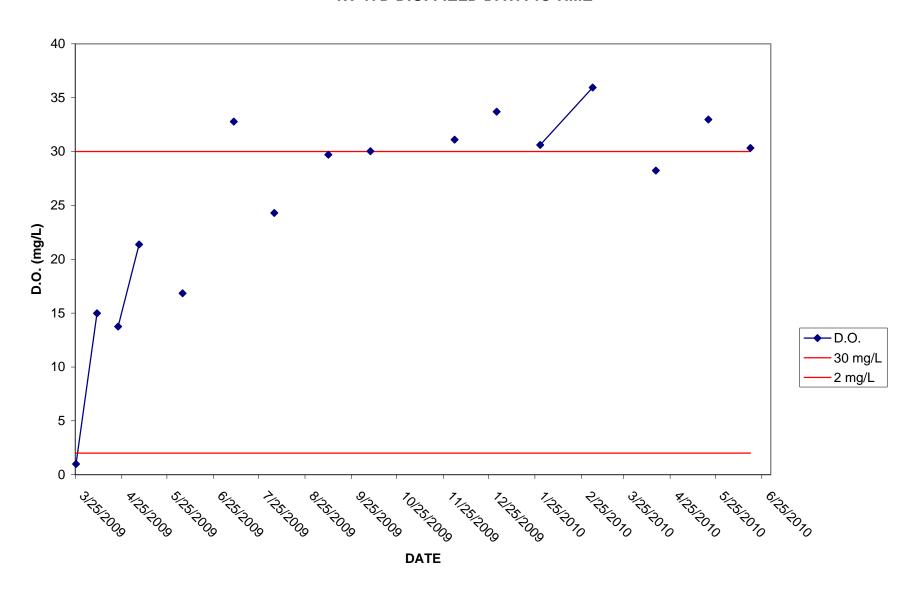
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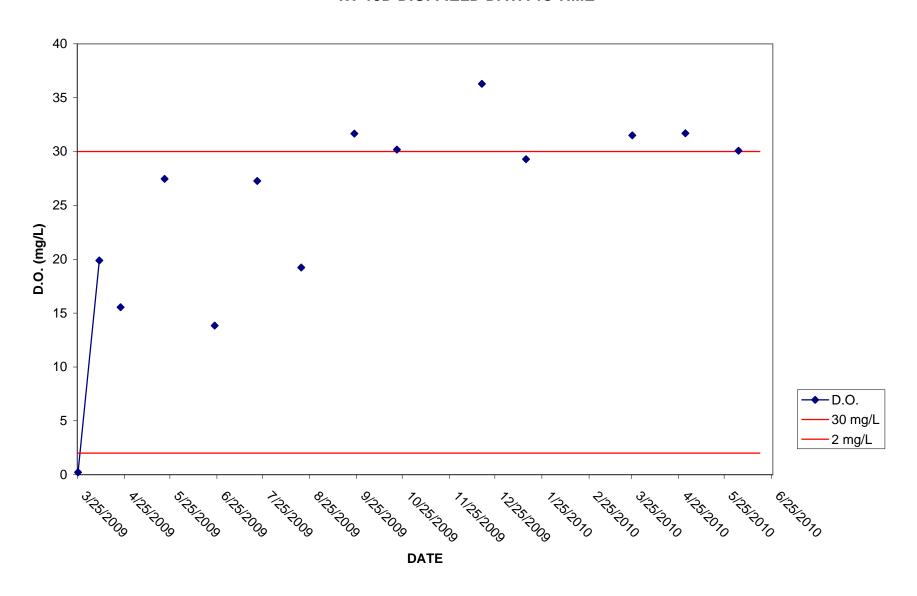
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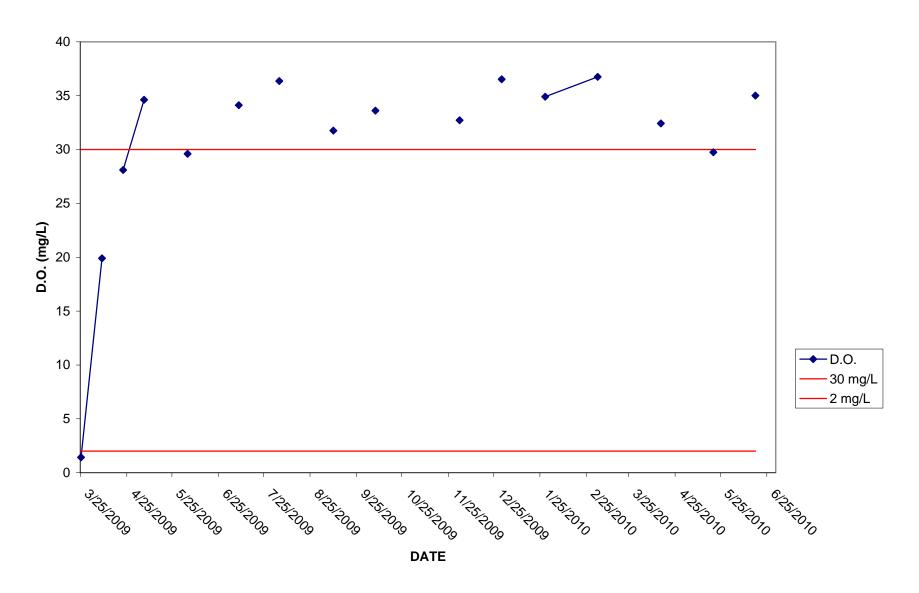
IW-17D D.O. FIELD DATA vs TIME



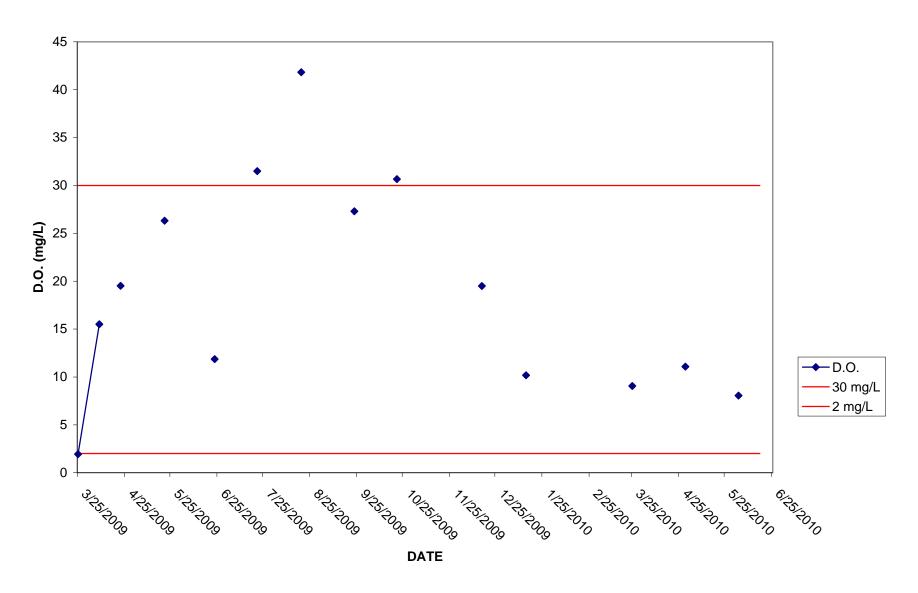
IW-18D D.O. FIELD DATA vs TIME



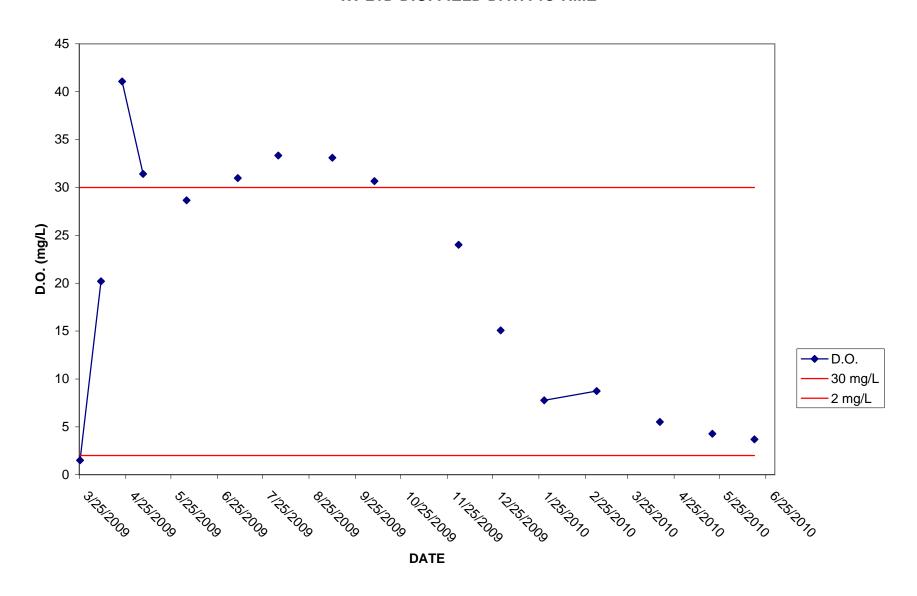
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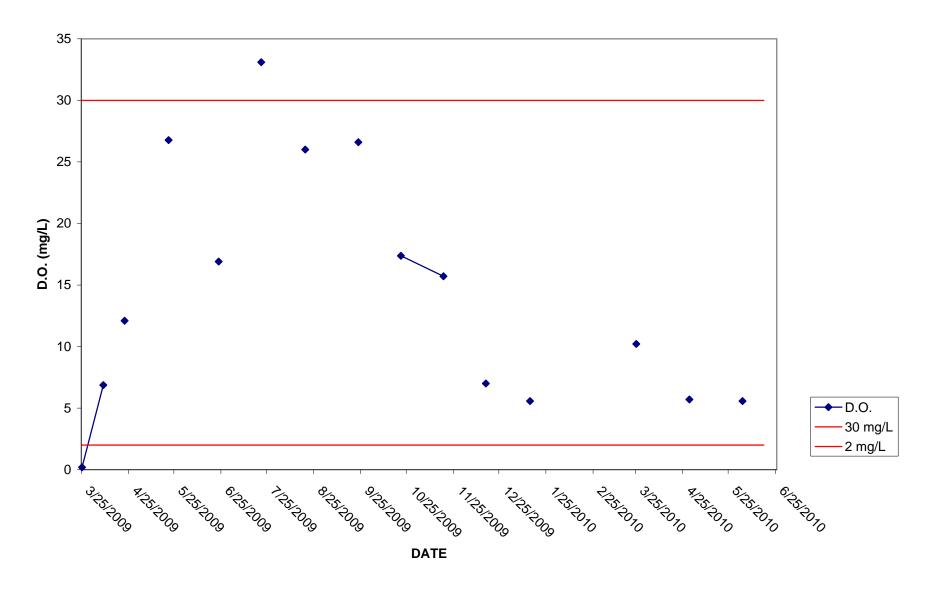
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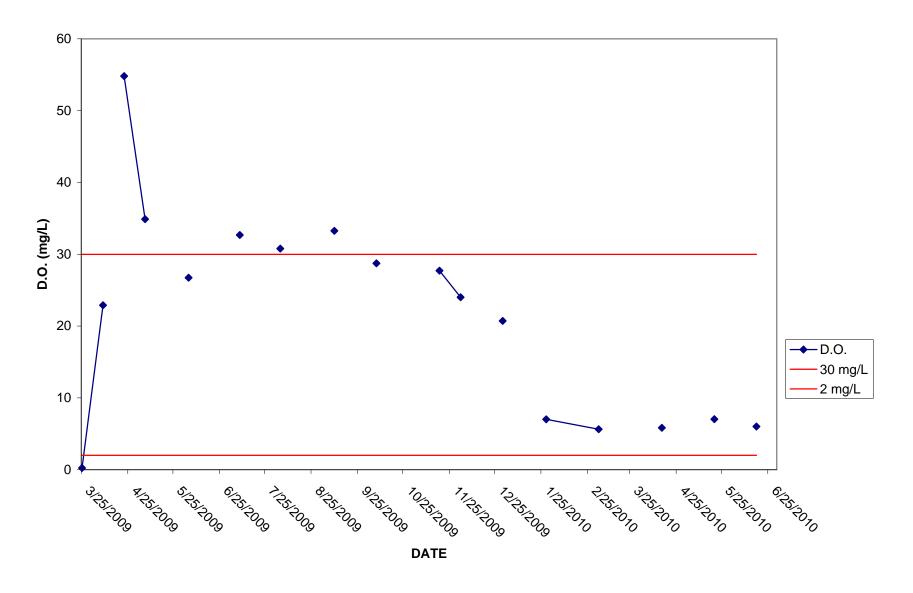
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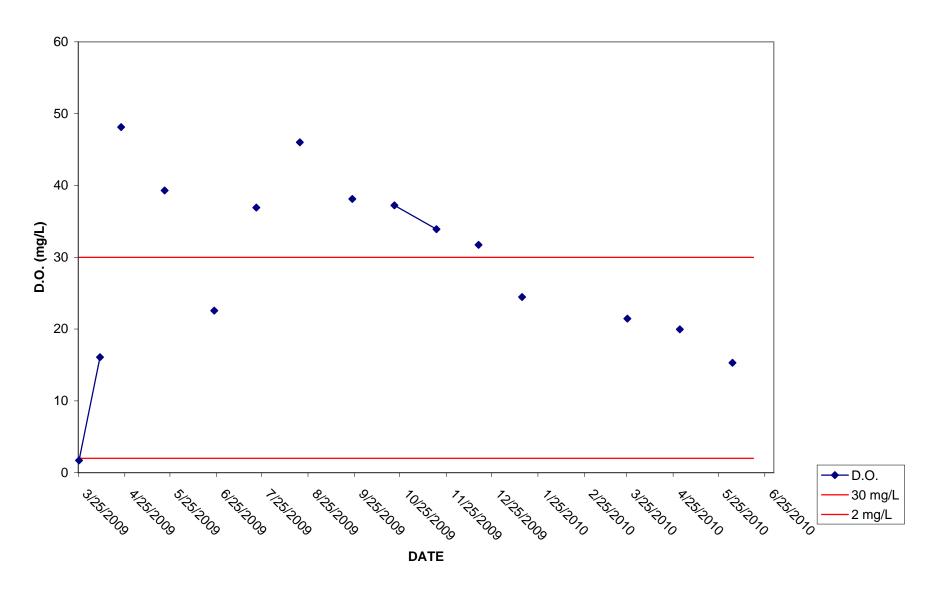
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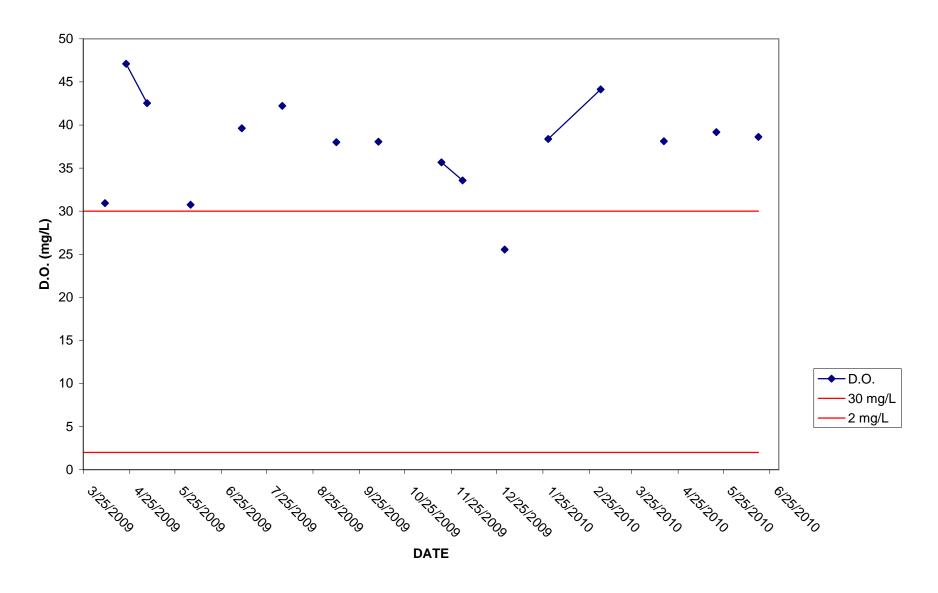
IW-23D D.O. FIELD DATA vs TIME



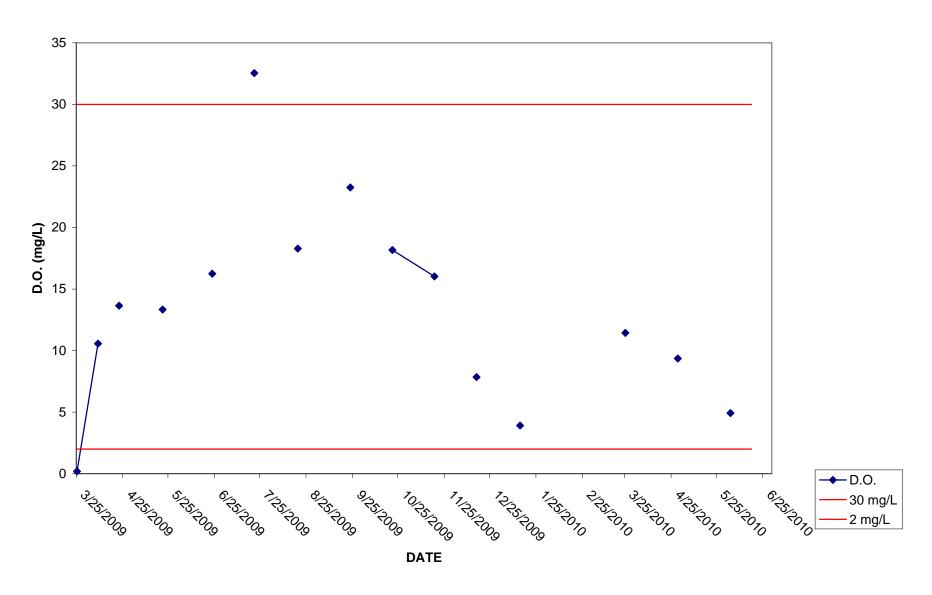
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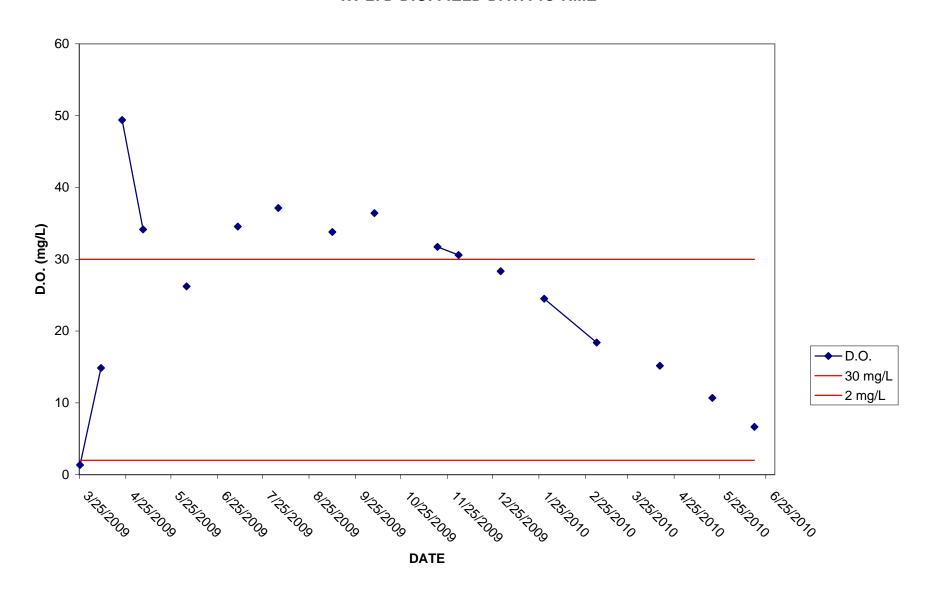
IW-25D D.O. FIELD DATA vs TIME



IW-26D D.O. FIELD DATA vs TIME



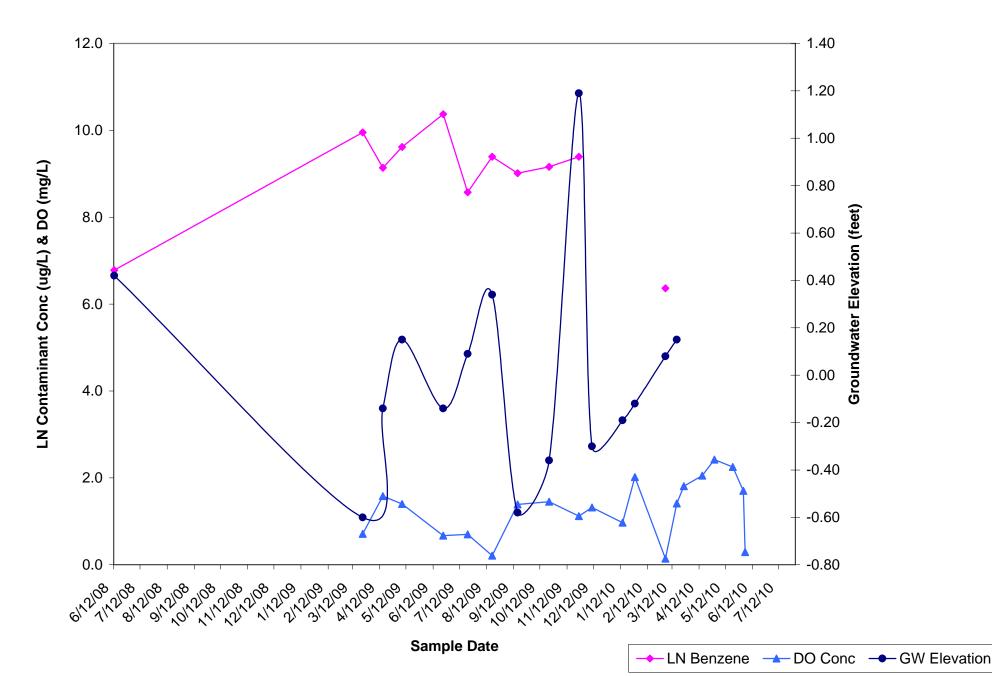
IW-27D D.O. FIELD DATA vs TIME

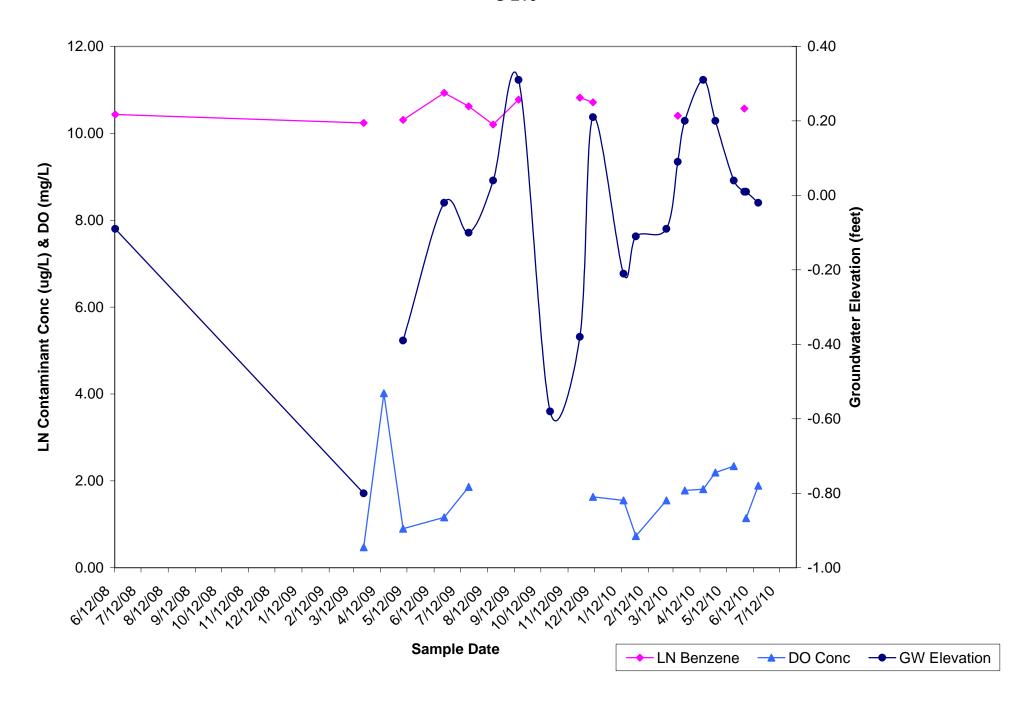


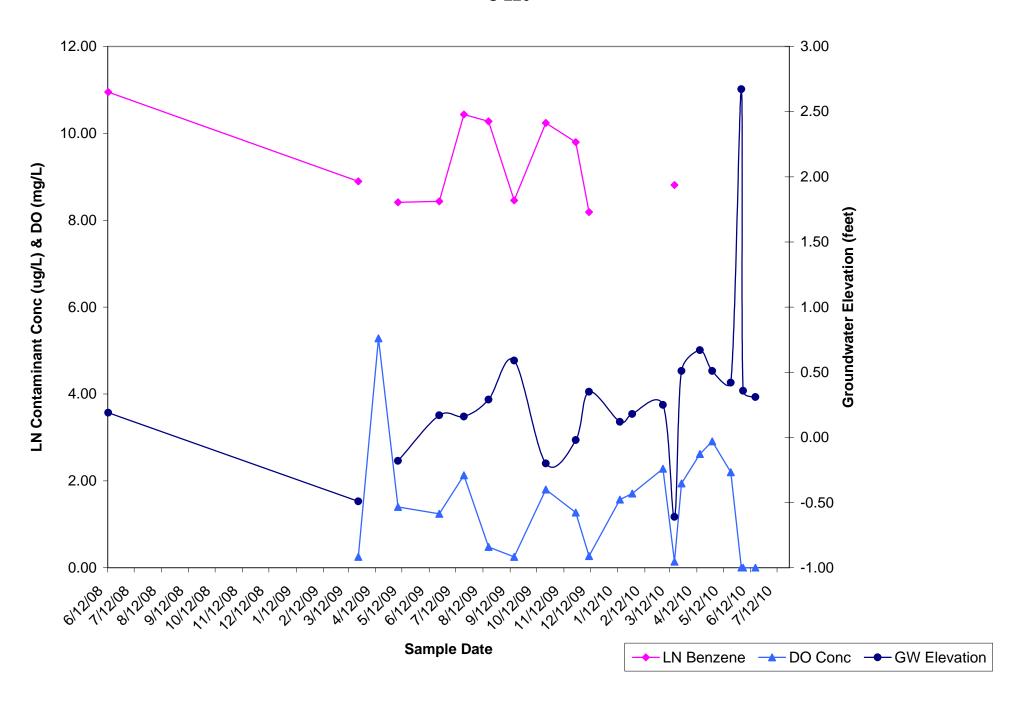


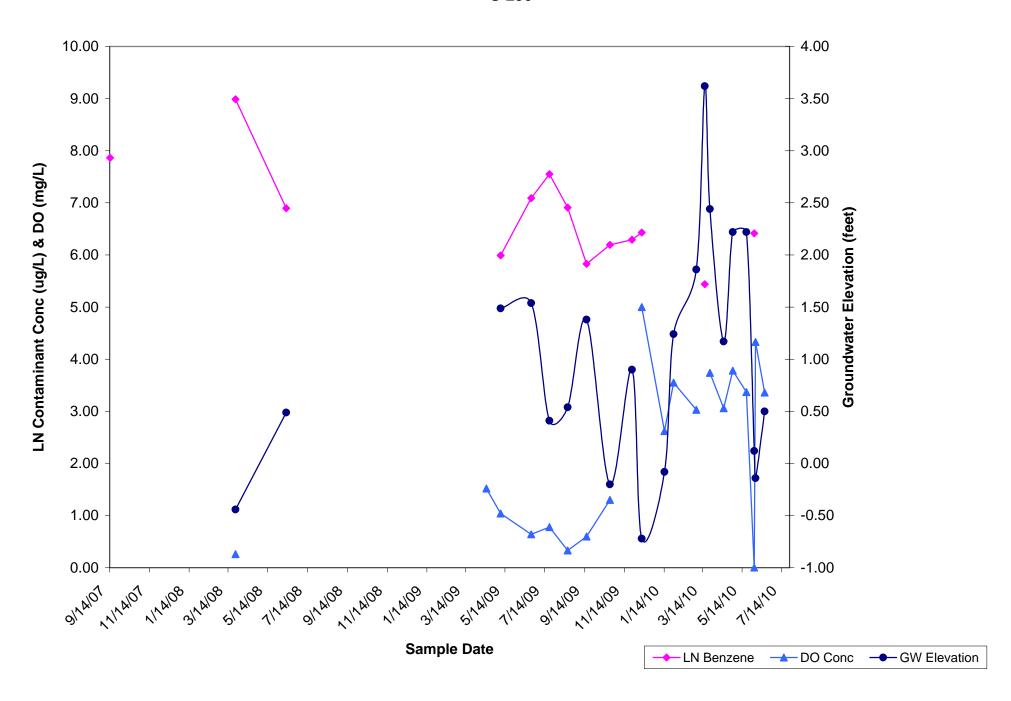
ATTACHMENT C

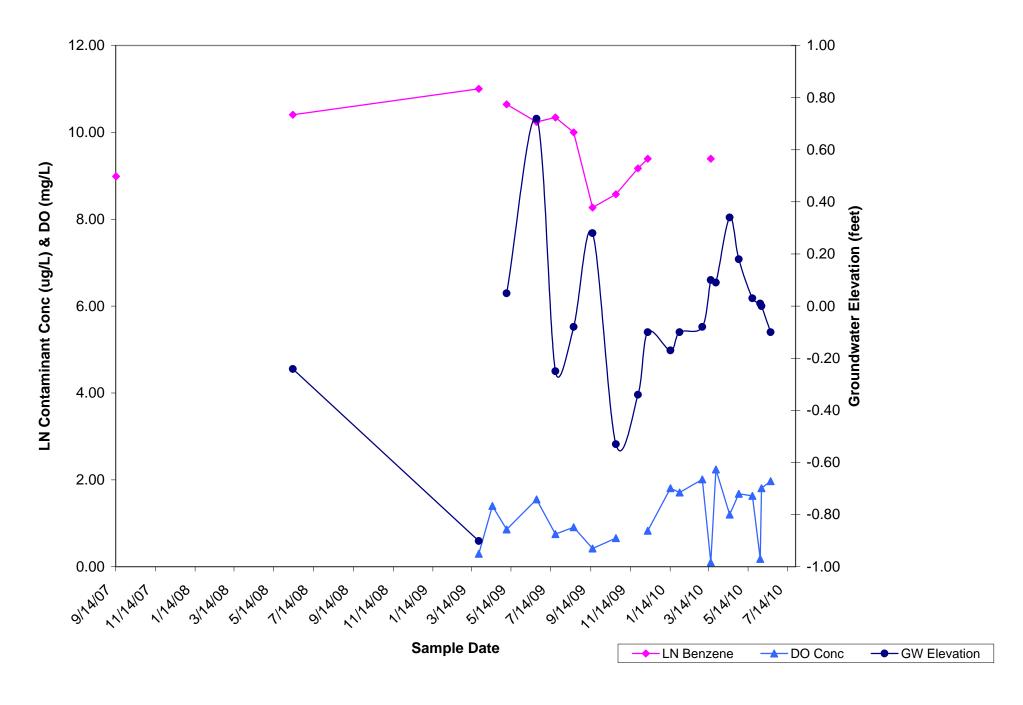
DO, Benzene and Groundwater Elevation vs Time Graphs

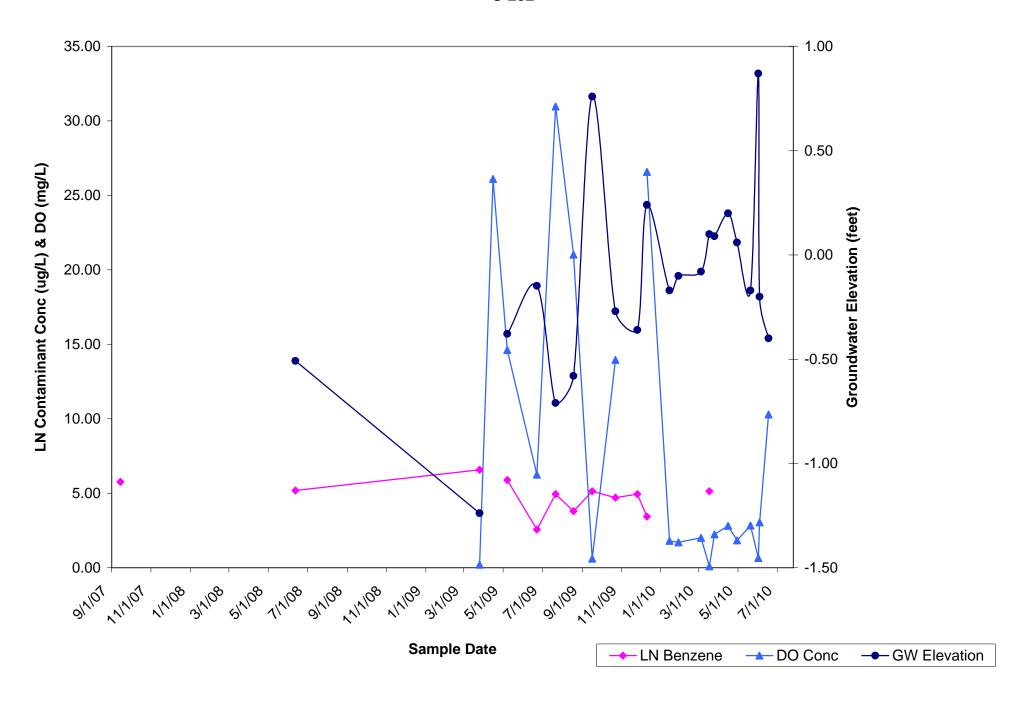


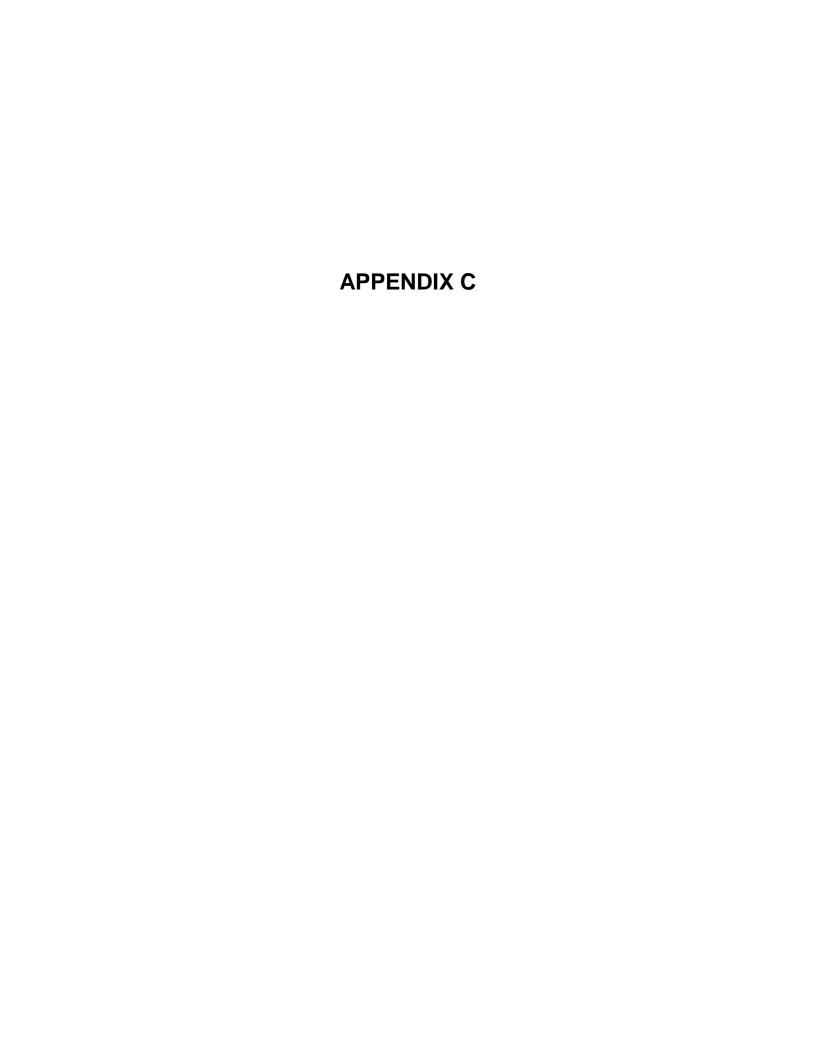












Sunoco, Inc. Philadelphia Refinery AOI 8: Jackson Street Sewer Water Curtain

Second Quarter 2010

	PII	D readings (pp	om)	
Date	Blower	Water Curtain	Interceptor Chamber	Comments
09-Apr-10	NA	0.6	0.0	
16-Apr-10	NA	0.0	0.0	
23-Apr-10	NA	0.0	0.0	
30-Apr-10	NA	2.2	0.4	
07-May-10	NA	1.7	0.0	
14-May-10	NA	0.0	0.0	
21-May-10	NA	0.0	0.0	
28-May-10	NA	0.0	0.0	
04-Jun-10	NA	2.2	0.0	
11-Jun-10	NA	1.8	0.0	
18-Jun-10	NA	0.0	0.0	
25-Jun-10	NA	0.4	0.0	
30-Jun-10	NA	0.0	0.0	

Notes:

ppm: parts per million

NA: Not Available (PID readings are not collected at the blower.)

The totalizer was removed on December 11, 2009.

The system was operational throughout the reporting period.

APPENDIX D

(electronic copy only; provided on CD included with report)



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ANALYTICAL RESULTS

Prepared by:

Prepared for:

Lancaster Laboratories 2425 New Holland Pike Lancaster, PA 17605-2425 Sunoco c/o Stantec 1060 Andrew Drive Suite 140 West Chester PA 19380

May 19, 2010

Project: Sunoco Philadelphia - 26th St

Submittal Date: 05/07/2010 Group Number: 1193762 PO Number: SUNOCO PHILADELPHIA State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LLI) #
S-271 Grab Water Sample	5975055
S-272 Grab Water Sample	5975056
S-273 Grab Water Sample	5975057
S-274 Grab Water Sample	5975058
S-275 Grab Water Sample	5975059
S-85 Grab Water Sample	5975060
S-88 Grab Water Sample	5975061
S-86 Grab Water Sample	5975062
S-89 Grab Water Sample	5975063
S-99 Grab Water Sample	5975064
S-101 Grab Water Sample	5975065
S-196 Grab Water Sample	5975066
S-193 Grab Water Sample	5975067
S-98 Grab Water Sample	5975068
S-268 Grab Water Sample	5975069

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO

Sunoco c/o Stantec

Attn: Jennifer Menges



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Questions? Contact your Client Services Representative Loran A Carter at (717) 656-2300 Ext. 1375

Respectfully Submitted,

Max E. Snavely Senior Specialist



As Received

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Page 1 of 2

Sample Description: S-271 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975055 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 10:00 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-271

CAT No.	Analysis Name		CAS Number	As Received Result	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l	
10943	Benzene		71-43-2	980	5	10
10943	1,2-Dichloroethane		107-06-2	N.D.	5	10
10943	Ethylbenzene		100-41-4	110	5	10
10943			98-82-8	76	5	10
10943	Methyl Tertiary But	yl Ether		38	5	10
10943	Naphthalene		91-20-3	210	10	10
10943	Toluene		108-88-3	29	5	10
10943	1,2,4-Trimethylbenz	ene	95-63-6	58	5	10
10943		ene	108-67-8	66	5	10
10943	Xylene (Total)		1330-20-7	140	5	10
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l	
00774	Anthracene		120-12-7	2.8	0.020	1
00774	Benzo(a)anthracene		56-55-3	0.40	0.0098	1
00774	Benzo(a)pyrene		50-32-8	0.27	0.0098	1
00774	Benzo(b)fluoranthen	e	205-99-2	0.21	0.0078	1
00774		e	191-24-2	0.20	0.059	1
00774	· 2 · · · ·		218-01-9	0.59	0.059	1
00774	Fluorene		86-73-7	16	0.098	1
00774			85-01-8	18	0.20	5
00774	Pyrene		129-00-0	2.3	0.098	1
GC Mis	scellaneous	SW-846	8011	ug/l	ug/l	
07879	Ethylene dibromide		106-93-4	N.D.	0.017	1
Metals	B Dissolved	SW-846	6020	mg/l	mg/l	
06035	Lead		7439-92-1	0.0064	0.000050	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010 12:	34 Anita M Dale	10
10943	UST Unleaded/Leaded+TMBs	SW-846 8260B	1	P101321AA	05/12/2010 12:	34 Anita M Dale	10
	8260						
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010 14:	54 Mark A Clark	1
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/17/2010 09:	51 Mark A Clark	5
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010 16:	50 JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101310002A	05/13/2010 19:	39 Tyler O Griffin	1



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Sample Description: S-271 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975055 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 10:00 by TC Sunoco c/o Stantec 1060 Andrew Drive

Suite 140

West Chester PA 19380

Submitted: 05/07/2010 19:30

Reported: 05/19/2010 10:24

Discard: 07/19/2010

S-271

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
07786	EDB Extraction	SW-846 8011	1	101310002A	05/11/2010	18:00	Kelli M Barto	1
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010	15:29	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A	1	101336050002	05/13/2010	20:30	Mirit S Shenouda	1



As Received

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Page 1 of 2

Sample Description: S-272 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975056 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 10:35 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-272

CAT No.	Analysis Name		CAS Number	As Received Result	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l	
10943	Benzene		71-43-2	4	0.5	1
10943	1,2-Dichloroethane		107-06-2	N.D.	0.5	1
10943	Ethylbenzene		100-41-4	N.D.	0.5	1
10943	Isopropylbenzene		98-82-8	8	0.5	1
10943	Methyl Tertiary But	yl Ether	1634-04-4	N.D.	0.5	1
10943	Naphthalene		91-20-3	N.D.	1	1
10943	Toluene		108-88-3	0.6 J	0.5	1
10943	1,2,4-Trimethylbenz	ene	95-63-6	0.7 J	0.5	1
10943	1,3,5-Trimethylbenz	ene	108-67-8	N.D.	0.5	1
10943	Xylene (Total)		1330-20-7	2	0.5	1
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l	
00774	Anthracene		120-12-7	0.27	0.019	1
00774	Benzo(a)anthracene		56-55-3	0.020 J	0.0095	1
00774	Benzo(a)pyrene		50-32-8	0.024 J	0.0095	1
00774	Benzo(b) fluoranthen	е	205-99-2	0.023 J	0.0076	1
00774	Benzo(g,h,i)perylen	е	191-24-2	N.D.	0.057	1
00774	Chrysene		218-01-9	0.073 J	0.057	1
00774	Fluorene		86-73-7	1.8	0.095	1
00774	Phenanthrene		85-01-8	0.47	0.038	1
00774	Pyrene		129-00-0	0.24 J	0.095	1
GC Mis	scellaneous	SW-846	8011	ug/l	ug/l	
07879	Ethylene dibromide		106-93-4	N.D.	0.018	1
Metals	s Dissolved	SW-846	6020	mg/l	mg/l	
06035	Lead		7439-92-1	0.00044 J	0.000050	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Tim	ne		Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010	13:03	Anita M Dale	1
10943	UST Unleaded/Leaded+TMBs	SW-846 8260B	1	P101321AA	05/12/2010	13:03	Anita M Dale	1
	8260							
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010	15:33	Mark A Clark	1
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010	16:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101310002A	05/14/2010	00:08	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101310002A	05/11/2010	18:00	Kelli M Barto	1



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Sample Description: S-272 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975056 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 10:35 by TC Sunoco c/o Stantec 1060 Andrew Drive

Suite 140

West Chester PA 19380

Submitted: 05/07/2010 19:30 Reported: 05/19/2010 10:24

Discard: 07/19/2010

S-272

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
06035	Lead	SW-846 6020	1	101336050002A	05/18/2010	11:46	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010	20:30	Mirit S Shenouda	1



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Page 1 of 2

Sample Description: S-273 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975057 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 11:10 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-273

CAT No.	Analysis Name		CAS Number	As Received Jumber Result		As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l		ug/l	
10943	Benzene		71-43-2	510		3	5
10943	1,2-Dichloroethane		107-06-2	N.D.		3	5
10943	Ethylbenzene		100-41-4	41		3	5
10943	Isopropylbenzene		98-82-8	15		3	5
10943	Methyl Tertiary Buty	yl Ether	1634-04-4	N.D.		3	5
10943	Naphthalene		91-20-3	N.D.		5	5
10943	Toluene		108-88-3	9		3	5
10943	1,2,4-Trimethylbenze	ene	95-63-6	16		3	5
10943	1,3,5-Trimethylbenze	ene	108-67-8	10	J	3	5
10943	Xylene (Total)		1330-20-7	99		3	5
GC/MS	Semivolatiles	SW-846	8310	ug/l		ug/l	
00774	Anthracene		120-12-7	0.20		0.019	1
00774	Benzo(a)anthracene		56-55-3	0.026 J	J	0.0096	1
00774	Benzo(a)pyrene		50-32-8	0.018 3	J	0.0096	1
00774	Benzo(b) fluoranthene	е	205-99-2	0.012 3	J	0.0077	1
00774	Benzo(g,h,i)perylene	е	191-24-2	N.D.		0.058	1
00774	Chrysene		218-01-9	0.068 J	Ţ	0.058	1
00774	Fluorene		86-73-7	1.8		0.096	1
00774	Phenanthrene		85-01-8	0.92		0.039	1
00774	Pyrene		129-00-0	0.24 J	J	0.096	1
GC Mis	scellaneous	SW-846	8011	ug/l		ug/l	
07879	Ethylene dibromide		106-93-4	N.D.		0.018	1
Metals	s Dissolved	SW-846	6020	mg/l		mg/l	
06035	Lead		7439-92-1	0.0015		0.000050	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Tim	ne		Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010	13:32	Anita M Dale	5
10943	UST Unleaded/Leaded+TMBs	SW-846 8260B	1	P101321AA	05/12/2010	13:32	Anita M Dale	5
	8260							
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010	16:12	Mark A Clark	1
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010	16:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101310002A	05/14/2010	01:07	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101310002A	05/11/2010	18:00	Kelli M Barto	1



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Sample Description: S-273 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975057 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 11:10 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-273

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010	15:31	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A	1	101336050002	05/13/2010	20:30	Mirit S Shenouda	1



As Received

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Sample Description: S-274 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975058 LLI Group # 1193762 Account # 11183

Dilution

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 11:40 Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

West Chester PA 19380 Reported: 05/19/2010 10:24

Discard: 07/19/2010

S-274

CAT

No.	Analysis Name		CAS Number	As Received Result	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l	
10943	Benzene		71-43-2	360	5	10
10943	1,2-Dichloroethane		107-06-2	N.D.	5	10
10943	Ethylbenzene		100-41-4	350	5	10
10943	Isopropylbenzene		98-82-8	67	5	10
10943	Methyl Tertiary Buty	yl Ether	1634-04-4	61	5	10
10943	Naphthalene		91-20-3	200	10	10
10943	Toluene		108-88-3	30	5	10
10943	1,2,4-Trimethylbenze	ene	95-63-6	520	5	10
10943	1,3,5-Trimethylbenze	ene	108-67-8	190	5	10
10943	Xylene (Total)		1330-20-7	1,400	5	10
volat to th labor	ervation requirements tile analysis did not ne volatile nature of ratory to adjust the sample was pH = 5.	have a p	m DH < 2 at the time $ m Lytes$, it is not a	of analysis. Due ppropriate for the		
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l	
00774	Anthracene		120-12-7	1.0	0.019	1
00774	Benzo(a)anthracene		56-55-3	0.15	0.0097	1
00774	Benzo(a)pyrene		50-32-8	0.10	0.0097	1
00774	Benzo(b) fluoranthene	9	205-99-2	0.072	0.0077	1
00774	Benzo(g,h,i)perylene	9	191-24-2	N.D.	0.058	1
00774	Chrysene		218-01-9	0.26	0.058	1
00774	Fluorene		86-73-7	8.1	0.097	1
00774	Phenanthrene		85-01-8	6.6	0.039	1
00774	Pyrene		129-00-0	1.1	0.097	1
GC Mis	cellaneous	SW-846	8011	ug/l	ug/l	
07879	Ethylene dibromide		106-93-4	N.D.	0.018	1
Metals	Dissolved	SW-846	6020	mg/l	mg/l	
06035			7439-92-1	0.0056	0.000050	1

As Received

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010 14:00	Anita M Dale	10



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Sample Description: S-274 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975058 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 11:40 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-274

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	e	Analyst	Dilution Factor
10943	UST Unleaded/Leaded+TMBs	SW-846 8260B	1	P101321AA	05/12/2010	14:00	Anita M Dale	10
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010	17:29	Mark A Clark	1
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010	16:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101310002A	05/14/2010	01:37	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101310002A	05/11/2010	18:00	Kelli M Barto	1
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010	15:33	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010	20:30	Mirit S Shenouda	1



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Sample Description: S-275 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975059 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 13:05 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-275

CAT No.	Analysis Name		CAS Number	As Recei ^r Result	ved	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l		ug/l	
10943	Benzene		71-43-2	150		3	5
10943	1,2-Dichloroethane		107-06-2	N.D.		3	5
10943	Ethylbenzene		100-41-4	43		3	5
10943	Isopropylbenzene		98-82-8	7 J		3	5
10943	Methyl Tertiary Buty	yl Ether	1634-04-4	9		3	5
10943	Naphthalene		91-20-3	39		5	5
10943	Toluene		108-88-3	8		3	5
10943	1,2,4-Trimethylbenze	ene	95-63-6	41		3	5
10943	1,3,5-Trimethylbenze	ene	108-67-8	31		3	5
10943	Xylene (Total)		1330-20-7	64		3	5
GC/MS	Semivolatiles	SW-846	8310	ug/l		ug/l	
00774	Anthracene		120-12-7	0.21		0.019	1
00774	Benzo(a)anthracene		56-55-3	0.057		0.0095	1
00774	Benzo(a)pyrene		50-32-8	0.042		0.0095	1
00774	Benzo(b) fluoranthene	e	205-99-2	0.030		0.0076	1
00774	Benzo(g,h,i)perylene	e	191-24-2	N.D.		0.057	1
00774	Chrysene		218-01-9	0.097 J		0.057	1
00774	Fluorene		86-73-7	1.0		0.095	1
00774	Phenanthrene		85-01-8	1.1		0.038	1
00774	Pyrene		129-00-0	0.33 J		0.095	1
GC Mis	scellaneous	SW-846	8011	ug/l		ug/l	
07879	Ethylene dibromide		106-93-4	N.D.		0.017	1
Metals	s Dissolved	SW-846	6020	mg/l		mg/l	
06035	Lead		7439-92-1	0.0023		0.000050	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Tir	ne		Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010	14:29	Anita M Dale	5
10943	UST Unleaded/Leaded+TMBs	SW-846 8260B	1	P101321AA	05/12/2010	14:29	Anita M Dale	5
	8260							
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010	18:08	Mark A Clark	1
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010	16:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101310002A	05/14/2010	02:07	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101310002A	05/11/2010	18:00	Kelli M Barto	1



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Sample Description: S-275 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975059 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 13:05 by TC Sunoco c/o Stantec 1060 Andrew Drive

Suite 140

West Chester PA 19380

Submitted: 05/07/2010 19:30

Reported: 05/19/2010 10:24

Discard: 07/19/2010

S-275

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010	15:34	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010	20:30	Mirit S Shenouda	1



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Sample Description: S-85 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975060 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 14:05 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S--85

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor				
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l					
10943	Benzene		71-43-2	10	0.5	1				
10943	1,2-Dichloroethane		107-06-2	N.D.	0.5	1				
10943	Ethylbenzene		100-41-4	46	0.5	1				
10943	Isopropylbenzene		98-82-8	96	0.5	1				
10943	Methyl Tertiary But	yl Ether	1634-04-4	22	0.5	1				
10943	Naphthalene		91-20-3	120	1	1				
10943	Toluene		108-88-3	2	0.5	1				
10943	1,2,4-Trimethylbenz	ene	95-63-6	130	0.5	1				
10943	1,3,5-Trimethylbenz	ene	108-67-8	150	0.5	1				
10943	Xylene (Total)		1330-20-7	240	0.5	1				
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l					
00774	Anthracene		120-12-7	9.1	0.19	10				
00774	Benzo(a)anthracene		56-55-3	4.5	0.097	10				
00774	Benzo(a)pyrene		50-32-8	5.0	0.097	10				
00774	Benzo(b) fluoranthen	е	205-99-2	4.5	0.078	10				
00774	Benzo(g,h,i)perylen	е	191-24-2	4.6	0.58	10				
00774	Chrysene		218-01-9	7.3	0.58	10				
00774	Fluorene		86-73-7	22	0.97	10				
00774	Phenanthrene		85-01-8	36	0.39	10				
00774	Pyrene		129-00-0	17	0.97	10				
prob Due	The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram. Due to the sample matrix an initial dilution was necessary to perform the analysis. Therefore, the reporting limits for the PAH by HPLC compounds									
	raised.	-	5	1						
GC Mis	scellaneous	SW-846	8011	ug/l	ug/l					
07879	Ethylene dibromide		106-93-4	N.D.	0.017	1				
Metals	s Dissolved	SW-846	6020	mg/l	mg/l					
06035	Lead		7439-92-1	0.0042	0.000050	1				

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101331AA	05/14/2010 01:20	Kellv E Keller	1



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Sample Description: S-85 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975060 LLI Group # 1193762 # 11183 Account

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 14:05 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140 West Chester PA 19380

Reported: 05/19/2010 10:24

Discard: 07/19/2010

S--85

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10943	UST Unleaded/Leaded+TMBs 8260	SW-846 8260B	1	P101331AA	05/14/2010	01:20	Kelly E Keller	1
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010	23:26	Mark A Clark	10
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010	16:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101310002A	05/14/2010	03:37	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101310002A	05/11/2010	18:00	Kelli M Barto	1
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010	15:36	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010	20:30	Mirit S Shenouda	1



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Sample Description: S-88 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975061 LLI Group # 1193762

Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 14:50 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S--88

CAT No.	Analysis Name		CAS Number	As Re Resul	ceived		As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l			ug/l	
10943	Benzene		71-43-2	8			1	2
10943	1,2-Dichloroethane		107-06-2	N.D.			1	2
10943	Ethylbenzene		100-41-4	N.D.			1	2
10943	Isopropylbenzene		98-82-8	15			1	2
10943	Methyl Tertiary Buty	yl Ether	1634-04-4	170			1	2
10943	Naphthalene		91-20-3	N.D.			2	2
10943	Toluene		108-88-3	3			1	2
10943	1,2,4-Trimethylbenze	ene	95-63-6	N.D.			1	2
10943	1,3,5-Trimethylbenze	ene	108-67-8	N.D.			1	2
10943	Xylene (Total)		1330-20-7	1	J		1	2
GC/MS	Semivolatiles	SW-846	8310	ug/l			ug/l	
00774	Anthracene		120-12-7	83			4.0	10
00774	Benzo(a)anthracene		56-55-3	90			2.0	10
00774	Benzo(a)pyrene		50-32-8	160			2.0	10
00774	Benzo(b)fluoranthen	e	205-99-2	250			1.6	10
00774	Benzo(q,h,i)perylen	e	191-24-2	330			12	10
00774	Chrysene		218-01-9	360			12	10
00774	Fluorene		86-73-7	160			20	10
00774	Phenanthrene		85-01-8	240			8.0	10
00774	Pyrene		129-00-0	350			20	10
	to the nature of the	-		-	was used for	r		

Due to the nature of the sample matrix, a reduced aliquot was used for analysis. The reporting limits were raised accordingly.

The usual reporting limits were not attained due to the matrix of the sample or interferences observed in the HPLC PAH analysis.

The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.

Due to the sample matrix an initial dilution was necessary to perform the analysis. Therefore, the reporting limits for the PAH by HPLC compounds were raised.

GC Miscellaneous 07879 Ethylene dibromide	SW-846 8011 106-93-4	ug/l N.D.	ug/l 0.018	1
07879 Echylene dibiomide	100-93-4	N.D.	0.018	_
Metals Dissolved	SW-846 6020	mg/l	mg/l	

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.



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Sample Description: S-88 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975061 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/05/2010 14:50 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S--88

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010 15:27	Anita M Dale	2
10943	UST Unleaded/Leaded+TMBs 8260	SW-846 8260B	1	P101321AA	05/12/2010 15:27	Anita M Dale	2
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/15/2010 00:13	Mark A Clark	10
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010 16:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101310002A	05/14/2010 04:06	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101310002A	05/11/2010 18:00	Kelli M Barto	1
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010 16:06	Choon Y Tian	5
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010 20:30	Mirit S Shenouda	1



As Received

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Sample Description: S-86 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975062 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 09:35 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S--86

CAT No.	Analysis Name		CAS Number	As Received Result	Method Detection Limit	Dilution Factor			
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l				
10943	Benzene		71-43-2	92	3	5			
10943	1,2-Dichloroethane		107-06-2	N.D.	3	5			
10943	Ethylbenzene		100-41-4	14	3	5			
10943	Isopropylbenzene		98-82-8	40	3	5			
10943	Methyl Tertiary But	yl Ether	1634-04-4	31	3	5			
10943	Naphthalene		91-20-3	9 J	5	5			
10943	Toluene		108-88-3	24	3	5			
10943	1,2,4-Trimethylbenze	ene	95-63-6	200	3	5			
10943	1,3,5-Trimethylbenze	ene	108-67-8	66	3	5			
10943	Xylene (Total)		1330-20-7	390	3	5			
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l				
00774	Anthracene		120-12-7	36	2.0	10			
00774	Benzo(a)anthracene		56-55-3	30	1.0	10			
00774	Benzo(a)pyrene		50-32-8	42	1.0	10			
00774	Benzo(b) fluoranthen	е	205-99-2	72	0.80	10			
00774	Benzo(g,h,i)perylen	е	191-24-2	93	6.0	10			
00774	Chrysene		218-01-9	120	6.0	10			
00774	Fluorene		86-73-7	47	10	10			
00774	Phenanthrene		85-01-8	61	4.0	10			
00774	Pyrene		129-00-0	75	10	10			
anal were	Due to the sample matrix an initial dilution was necessary to perform the analysis. Therefore, the reporting limits for the PAH by HPLC compounds were raised. Due to the nature of the sample matrix, a reduced aliquot was used for								
	ysis. The reporting								
GC Mis	scellaneous	SW-846	8011	ug/l	ug/l				
07879	Ethylene dibromide		106-93-4	N.D.	0.018	1			
Metals	B Dissolved	SW-846	6020	mg/l	mg/l				
06035	Lead		7439-92-1	0.00062 J	0.000050	1			

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010 15:56	Anita M Dale	5



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Sample Description: S-86 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975062 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 09:35 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S--86

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10943	UST Unleaded/Leaded+TMBs 8260	SW-846 8260B	1	P101321AA	05/12/2010 15:5	S Anita M Dale	5
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/15/2010 00:5	Mark A Clark	10
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010 16:5) JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101310002A	05/14/2010 04:3	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101310002A	05/11/2010 18:0) Kelli M Barto	1
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010 15:4	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010 20:3) Mirit S Shenouda	1



As Received

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Sample Description: S-89 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975063 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 10:15 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S--89

CAT No.	Analysis Name		CAS Number	As Received Result	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l	
10943	Benzene		71-43-2	100	3	5
10943	1,2-Dichloroethane		107-06-2	N.D.	3	5
10943	Ethylbenzene		100-41-4	37	3	5
10943			98-82-8	55	3	5
10943	Methyl Tertiary But	yl Ether	1634-04-4	38	3	5
10943	Naphthalene		91-20-3	53	5	5
10943	Toluene		108-88-3	N.D.	3	5
10943	1,2,4-Trimethylbenz	ene	95-63-6	230	3	5
10943	1,3,5-Trimethylbenz	ene	108-67-8	140	3	5
10943	Xylene (Total)		1330-20-7	150	3	5
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l	
00774	Anthracene		120-12-7	160	2.0	10
00774	Benzo(a)anthracene		56-55-3	60	1.0	10
00774	Benzo(a)pyrene		50-32-8	52	1.0	10
00774	Benzo(b)fluoranthen	е	205-99-2	54	0.80	10
00774	Benzo(g,h,i)perylen	е	191-24-2	49	6.0	10
00774	Chrysene		218-01-9	160	6.0	10
00774	Fluorene		86-73-7	210	10	10
00774	Phenanthrene		85-01-8	190	4.0	10
00774	Pyrene		129-00-0	750	10	10
anal Due anal	to the nature of the ysis. The reporting to the sample matrix ysis. Therefore, the raised.	limits we	ere raised accordinal dilution was ne	ngly. cessary to perform t	the	
GC Mis	scellaneous	SW-846	8011	ug/l	ug/l	
07879	Ethylene dibromide		106-93-4	N.D.	0.018	1
Metals	B Dissolved	SW-846	6020	mg/l	mg/l	
06035	Lead		7439-92-1	0.0015	0.000050	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010 16:24	Anita M Dale	5



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Sample Description: S-89 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975063 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 10:15 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S--89

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
10943	UST Unleaded/Leaded+TMBs 8260	SW-846 8260B	1	P101321AA	05/12/2010 16	6:24	Anita M Dale	5
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/15/2010 01	1:45	Mark A Clark	10
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010 16	6:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101310002A	05/14/2010 05	5:06	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101310002A	05/11/2010 18	8:00	Kelli M Barto	1
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010 15	5:41	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010 20	0:30	Mirit S Shenouda	1



As Received

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Sample Description: S-99 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975064 LLI Group # 1193762

Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 11:30 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S--99

Analysis Name		CAS Number			Method Detection Limit	Dilution Factor
Volatiles	SW-846	8260B	ug/l		ug/l	
Benzene		71-43-2	30		5	10
1,2-Dichloroethane		107-06-2	N.D.		5	10
Ethylbenzene		100-41-4	5	J	5	10
Isopropylbenzene		98-82-8	82		5	10
Methyl Tertiary Buty	yl Ether	1634-04-4	8	J	5	10
Naphthalene		91-20-3	N.D.		10	10
Toluene		108-88-3	23		5	10
1,2,4-Trimethylbenze	ene	95-63-6	N.D.		5	10
1,3,5-Trimethylbenze	ene	108-67-8	N.D.		5	10
Xylene (Total)		1330-20-7	27		5	10
Semivolatiles	SW-846	8310	ug/l		ug/l	
Anthracene		120-12-7	0.72		0.019	1
Benzo(a)anthracene		56-55-3	0.054		0.0095	1
Benzo(a)pyrene		50-32-8	0.033	J	0.0095	1
Benzo(b)fluoranthen	е	205-99-2	0.042		0.0076	1
Benzo(g,h,i)perylen	е	191-24-2	N.D.		0.057	1
Chrysene		218-01-9	0.092	J	0.057	1
Fluorene		86-73-7	4.4		0.095	1
Phenanthrene		85-01-8	3.8		0.038	1
Pyrene		129-00-0	0.41		0.095	1
scellaneous	SW-846	8011	ug/l		ug/l	
Ethylene dibromide		106-93-4	N.D.		0.018	1
s Dissolved	SW-846	6020	mg/l		mg/l	
Lead		7439-92-1	0.0014	1	0.000050	1
	Volatiles Benzene 1,2-Dichloroethane Ethylbenzene Isopropylbenzene Methyl Tertiary Buty Naphthalene Toluene 1,2,4-Trimethylbenzene Xylene (Total) Semivolatiles Anthracene Benzo(a) anthracene Benzo(b) fluoranthene Benzo(g,h,i) perylene Chrysene Fluorene Phenanthrene Pyrene scellaneous Ethylene dibromide b Dissolved	Volatiles SW-846 Benzene 1,2-Dichloroethane Ethylbenzene Isopropylbenzene Methyl Tertiary Butyl Ether Naphthalene Toluene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Xylene (Total) Semivolatiles SW-846 Anthracene Benzo(a) anthracene Benzo(b) fluoranthene Benzo(g,h,i) perylene Chrysene Fluorene Phenanthrene Pyrene scellaneous SW-846 Ethylene dibromide S Dissolved SW-846	Volatiles SW-846 8260B Benzene 71-43-2 1,2-Dichloroethane 107-06-2 Ethylbenzene 100-41-4 Isopropylbenzene 98-82-8 Methyl Tertiary Butyl Ether 1634-04-4 Naphthalene 91-20-3 Toluene 108-88-3 1,2,4-Trimethylbenzene 95-63-6 1,3,5-Trimethylbenzene 108-67-8 Xylene (Total) 1330-20-7 Semivolatiles SW-846 8310 Anthracene 120-12-7 Benzo(a) anthracene 56-55-3 Benzo(a) pyrene 50-32-8 Benzo(b) fluoranthene 205-99-2 Benzo(g,h,i) perylene 191-24-2 Chrysene 218-01-9 Fluorene 86-73-7 Phenanthrene 85-01-8 Pyrene 129-00-0 Scellaneous SW-846 8011 Ethylene dibromide 5W-846 6020	Volatiles SW-846 8260B ug/1	Volatiles SW-846 8260B ug/l Benzene 71-43-2 30 1,2-Dichloroethane 107-06-2 N.D. Ethylbenzene 100-41-4 5 J Isopropylbenzene 98-82-8 82 Methyl Tertiary Butyl Ether 1634-04-4 8 J Naphthalene 91-20-3 N.D. Toluene 108-88-3 23 1,2,4-Trimethylbenzene 95-63-6 N.D. 1,3,5-Trimethylbenzene 108-67-8 N.D. Xylene (Total) 1330-20-7 27 Semivolatiles SW-846 8310 ug/l Anthracene 120-12-7 0.72 Benzo(a) anthracene 120-12-7 0.72 Benzo(a) pyrene 50-32-8 0.033 J Benzo(b) fluoranthene 205-99-2 0.042 Benzo(g,h,i) perylene 191-24-2 N.D. Chrysene 218-01-9 0.092 J Fluorene 86-73-7 4.4 Phenanthrene <td>Analysis Name CAS Number Result Wethod Detection Limit Wolatiles SW-846 8260B ug/1 ug/1 ug/1 Benzene 71-43-2 30 5 107-06-2 N.D. 5 Ethylbenzene 100-41-4 5 J 5 SW-846 Result Wethod Detection Limit Wethod Detection Limit Result Ug/1 ug/1 5 SW-846 SW-846 Result Method Detection Limit Wethod Detection Limit Result Wethod Detection Limit Wethod Detection Limit Result Wethod Detection Limit State Solidation SW-846 8208 Wethod N.D. Wethod Detection Limit Wethod Detection Limit Wethod Detection Limit Solidation Solidation SW-846 Wethod Detection Limit Wethod Detection Limit Solidation SU-846 Wethod Detection Limit Wethod Detection SOLIDATION Wethod Detection Limit Solidation SOLIDA</td>	Analysis Name CAS Number Result Wethod Detection Limit Wolatiles SW-846 8260B ug/1 ug/1 ug/1 Benzene 71-43-2 30 5 107-06-2 N.D. 5 Ethylbenzene 100-41-4 5 J 5 SW-846 Result Wethod Detection Limit Wethod Detection Limit Result Ug/1 ug/1 5 SW-846 SW-846 Result Method Detection Limit Wethod Detection Limit Result Wethod Detection Limit Wethod Detection Limit Result Wethod Detection Limit State Solidation SW-846 8208 Wethod N.D. Wethod Detection Limit Wethod Detection Limit Wethod Detection Limit Solidation Solidation SW-846 Wethod Detection Limit Wethod Detection Limit Solidation SU-846 Wethod Detection Limit Wethod Detection SOLIDATION Wethod Detection Limit Solidation SOLIDA

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	\mathtt{Sample}	Analysis	Record
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CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	.	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010 1	7:22	Anita M Dale	10
10943	UST Unleaded/Leaded+TMBs	SW-846 8260B	1	P101321AA	05/12/2010 1	7:22	Anita M Dale	10
	8260							
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010 1	8:47	Mark A Clark	1
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010 1	6:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101320002A	05/13/2010 1	0:12	Tyler O Griffin	1
07796	FDB Extraction	CM-016 0011	1	1012200027	05/10/2010 1	0.00	Kelli M Parto	1



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Sample Description: S-99 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975064 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 11:30 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24

Discard: 07/19/2010

S--99

Laboratory Sample Analysis Record

West Chester PA 19380

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010	15:47	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010	20:30	Mirit S Shenouda	1



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Sample Description: S-101 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975065 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 12:20 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-101

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l	
10943	Benzene		71-43-2	260	3	5
10943	1,2-Dichloroethane		107-06-2	N.D.	3	5
10943	Ethylbenzene		100-41-4	N.D.	3	5
10943	Isopropylbenzene		98-82-8	21	3	5
10943	Methyl Tertiary But	yl Ether	1634-04-4	N.D.	3	5
10943	Naphthalene		91-20-3	N.D.	5	5
10943	Toluene		108-88-3	6	3	5
10943	1,2,4-Trimethylbenz	ene	95-63-6	N.D.	3	5
10943	1,3,5-Trimethylbenz	ene	108-67-8	N.D.	3	5
10943	Xylene (Total)		1330-20-7	4 J	3	5
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l	
00774	Anthracene		120-12-7	0.13	0.019	1
00774	Benzo(a)anthracene		56-55-3	0.028 J	0.0095	1
00774	Benzo(a)pyrene		50-32-8	0.028 J	0.0095	1
00774	Benzo(b)fluoranthen	.e	205-99-2	0.026 J	0.0076	1
00774	Benzo(g,h,i)perylen	.e	191-24-2	0.069 J	0.057	1
00774	Chrysene		218-01-9	N.D.	0.057	1
00774	Fluorene		86-73-7	1.4	0.095	1
00774	Phenanthrene		85-01-8	0.61	0.038	1
00774	Pyrene		129-00-0	0.23 J	0.095	1
GC Mis	scellaneous	SW-846	8011	ug/l	ug/l	
07879	Ethylene dibromide		106-93-4	N.D.	0.018	1
Metals	Dissolved	SW-846	6020	mg/l	mg/l	
06035	Lead	211 010	7439-92-1	0.00045 J	0.000050	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analy	rst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010 17	7:51 Anita	a M Dale	5
10943	UST Unleaded/Leaded+TMBs	SW-846 8260B	1	P101321AA	05/12/2010 17	7:51 Anita	a M Dale	5
	8260							
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010 19	9:26 Mark	A Clark	1
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010 16	5:50 JoEll	la L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101320002A	05/13/2010 10	:42 Tyler	r O Griffin	1
07796	FDB Extraction	CM-046 0011	1	1012200027	05/10/2010 10		M Parto	1



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Sample Description: S-101 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975065 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 12:20 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24

Discard: 07/19/2010

S-101

Laboratory Sample Analysis Record

West Chester PA 19380

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Ti	me		Factor
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010	15:48	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010	20:30	Mirit S Shenouda	1



As Received

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Sample Description: S-196 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975066 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 13:20 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-196

CAT No.	Analysis Name		CAS Number	As Received Result	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l	
10943	Benzene		71-43-2	N.D.	0.5	1
10943	1,2-Dichloroethane		107-06-2	N.D.	0.5	1
10943	Ethylbenzene		100-41-4	N.D.	0.5	1
10943	Isopropylbenzene		98-82-8	N.D.	0.5	1
10943	Methyl Tertiary But	yl Ether	1634-04-4	N.D.	0.5	1
10943	Naphthalene		91-20-3	N.D.	1	1
10943	Toluene		108-88-3	N.D.	0.5	1
10943	1,2,4-Trimethylbenz			N.D.	0.5	1
	1,3,5-Trimethylbenz	ene	108-67-8		0.5	1
10943	Xylene (Total)		1330-20-7	N.D.	0.5	1
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l	
00774	Anthracene		120-12-7	N.D.	0.040	1
00774	Benzo(a)anthracene		56-55-3	N.D.	0.020	1
00774	Benzo(a)pyrene		50-32-8	N.D.	0.020	1
00774			205-99-2	N.D.	0.016	1
00774		e	191-24-2	N.D.	0.12	1
00774	· 2 · · · ·		218-01-9	N.D.	0.12	1
	Fluorene		86-73-7	N.D.	0.20	1
	Phenanthrene		85-01-8	N.D.	0.080	1
	Pyrene		129-00-0	N.D.	0.20	1
	to the nature of the ysis. The reporting					
GC Mis	scellaneous	SW-846	8011	ug/l	ug/l	
07879	Ethylene dibromide		106-93-4	N.D.	0.018	1
Metals	s Dissolved	SW-846	6020	mg/l	mg/l	
06035	Lead		7439-92-1	N.D.	0.000050	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Tim	ne	Analyst	Dilution Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101321AA	05/12/2010	18:19	Anita M Dale	1
10943	UST Unleaded/Leaded+TMBs 8260	SW-846 8260B	1	P101321AA	05/12/2010	18:19	Anita M Dale	1
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010	20:05	Mark A Clark	1
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010	16:50	JoElla L Rice	1



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Sample Description: S-196 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975066 LLI Group # 1193762 # 11183 Account

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 13:20 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140 West Chester PA 19380

Reported: 05/19/2010 10:24

Discard: 07/19/2010

S-196

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07879	EDB in Wastewater	SW-846 8011	1	101320002A	05/13/2010 11:42	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101320002A	05/12/2010 18:00	Kelli M Barto	1
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010 15:50	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010 20:30	Mirit S Shenouda	1



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Sample Description: S-193 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975067 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 14:20 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-193

CAT No.	Analysis Name		CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l	
10943	Benzene		71-43-2	270	3	5
10943	1,2-Dichloroethane		107-06-2	N.D.	3	5
10943	Ethylbenzene		100-41-4	18	3	5
10943	Isopropylbenzene		98-82-8	9 J	3	5
10943	Methyl Tertiary Buty	yl Ether	1634-04-4	45	3	5
10943	Naphthalene		91-20-3	6 J	5	5
10943	Toluene		108-88-3	3 J	3	5
10943	1,2,4-Trimethylbenze	ene	95-63-6	12	3	5
10943	1,3,5-Trimethylbenze	ene	108-67-8	6 J	3	5
10943	Xylene (Total)		1330-20-7	63	3	5
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l	
00774	Anthracene		120-12-7	N.D.	0.025	1
00774	Benzo(a)anthracene		56-55-3	N.D.	0.0096	1
00774	Benzo(a)pyrene		50-32-8	N.D.	0.0096	1
00774	Benzo(b) fluoranthen	e	205-99-2	N.D.	0.0077	1
00774	Benzo(q,h,i)perylen	e	191-24-2	N.D.	0.058	1
00774	Chrysene		218-01-9	N.D.	0.058	1
00774	Fluorene		86-73-7	N.D.	0.35	1
00774	Phenanthrene		85-01-8	N.D.	0.038	1
00774	Pyrene		129-00-0	N.D.	0.096	1
repor	to the presence of ir rting limits were not rting limits for thes	attained	d for several targe	t compounds. The		
GC Mis	scellaneous	SW-846	8011	ug/l	ug/l	
07879	Ethylene dibromide		106-93-4	N.D.	0.018	1
Metals	Dissolved	SW-846	6020	mg/l	mg/l	
06035	Lead		7439-92-1	0.00017 J	0.000050	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101331AA	05/14/2010 01:4	9 Kelly E Keller	5
10943	UST Unleaded/Leaded+TMBs	SW-846 8260B	1	P101331AA	05/14/2010 01:4	9 Kelly E Keller	5
	8260						
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010 20:4	3 Mark A Clark	1



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Sample Description: S-193 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975067 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 14:20 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-193

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010	16:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101320002A	05/13/2010	12:41	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101320002A	05/12/2010	18:00	Kelli M Barto	1
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010	15:52	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010	20:30	Mirit S Shenouda	1



As Received

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Sample Description: S-98 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975068 LLI Group # 1193762

Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 15:05 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S--98

CAT No.	Analysis Name		CAS Number	As Received Result	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l	
10943	Benzene		71-43-2	170	5	10
10943	1,2-Dichloroethane		107-06-2	N.D.	5	10
10943	Ethylbenzene		100-41-4	110	5	10
10943	Isopropylbenzene		98-82-8	27	5	10
10943	Methyl Tertiary But	yl Ether	1634-04-4	42	5	10
10943	Naphthalene		91-20-3	68	10	10
10943	Toluene		108-88-3	7 J	5	10
10943	1,2,4-Trimethylbenz	ene	95-63-6	480	5	10
10943	1,3,5-Trimethylbenz	ene	108-67-8	150	5	10
10943	Xylene (Total)		1330-20-7	480	5	10
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l	
00774	Anthracene		120-12-7	N.D.	2.0	1
00774	Benzo(a)anthracene		56-55-3	0.42	0.0095	1
00774	Benzo(a)pyrene		50-32-8	0.28	0.0095	1
00774	Benzo(b) fluoranthen	е	205-99-2	0.22	0.0076	1
00774	Benzo(g,h,i)perylen	е	191-24-2	0.41	0.057	1
00774	Chrysene		218-01-9	1.6	0.057	1
00774	Fluorene		86-73-7	3.4	0.095	1
00774	Phenanthrene		85-01-8	6.6	0.038	1
00774	Pyrene		129-00-0	N.D.	9.9	1
repo	to the presence of in rting limits were not rting limits for thes	attained	d for several targe	t compounds. The		
GC Mis	scellaneous	SW-846	8011	ug/l	ug/l	
07879	Ethylene dibromide		106-93-4	N.D.	0.018	1
Metals	B Dissolved	SW-846	6020	mg/l	mg/l	
06035	Lead		7439-92-1	0.0035	0.000050	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution
No.					Date and Time	9		Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	P101331AA	05/14/2010 0	02:28	Kelly E Keller	10
10943	UST Unleaded/Leaded+TMBs	SW-846 8260B	1	P101331AA	05/14/2010 0	02:28	Kelly E Keller	10
	8260							
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010 2	21:22	Mark A Clark	1



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Sample Description: S-98 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975068 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 15:05 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 19:30 Suite 140 West Chester PA 19380

Discard: 07/19/2010

S--98

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	9	Analyst	Dilution Factor
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010 1	L6:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101320002A	05/13/2010 1	L3:11	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101320002A	05/12/2010 1	L8:00	Kelli M Barto	1
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010 1	L5:54	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010 2	20:30	Mirit S Shenouda	1



As Received

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Sample Description: S-268 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975069 LLI Group # 1193762

Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 15:40 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-268

CAT No.	Analysis Name		CAS Number	As Received Result	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l	
10943	Benzene		71-43-2	N.D.	0.5	1
10943	1,2-Dichloroethane		107-06-2	N.D.	0.5	1
10943	Ethylbenzene		100-41-4	N.D.	0.5	1
10943			98-82-8	N.D.	0.5	1
10943	Methyl Tertiary But	yl Ether	1634-04-4	N.D.	0.5	1
10943	Naphthalene		91-20-3	N.D.	1	1
10943	Toluene		108-88-3	N.D.	0.5	1
10943	1,2,4-Trimethylbenz	ene	95-63-6	N.D.	0.5	1
10943	1,3,5-Trimethylbenz	ene	108-67-8	N.D.	0.5	1
10943	Xylene (Total)		1330-20-7	N.D.	0.5	1
GC/MS	Semivolatiles	SW-846	8310	ug/l	ug/l	
00774	Anthracene		120-12-7	0.043 J	0.019	1
00774	Benzo(a)anthracene		56-55-3	N.D.	0.0095	1
00774	Benzo(a)pyrene		50-32-8	N.D.	0.0095	1
00774	Benzo(b)fluoranthen	е	205-99-2	0.0080 J	0.0076	1
00774	Benzo(g,h,i)perylen	е	191-24-2	N.D.	0.057	1
00774	Chrysene		218-01-9	0.069 J	0.057	1
00774	Fluorene		86-73-7	N.D.	0.095	1
00774	Phenanthrene		85-01-8	N.D.	0.10	1
00774	Pyrene		129-00-0	0.18 J	0.095	1
				ntion time, the normal The reporting limit for	a thia	
	ound was raised accor		or phenanthrene.	The reporting rimit for	L CHIS	
GC Mis	scellaneous	SW-846	8011	ug/l	ug/l	
07879	Ethylene dibromide		106-93-4	N.D.	0.018	1
Metals	s Dissolved	SW-846	6020	mg/l	mg/l	
06035			7439-92-1	0.00030 J	0.000050	1

General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/11

This sample was field filtered for dissolved metals.

Trip blank vials were not received by the laboratory for this sample group.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F101314AA	05/12/2010 01:)1 Kelly E Keller	1
10943	UST Unleaded/Leaded+TMBs	SW-846 8260B	1	F101314AA	05/12/2010 01:)1 Kelly E Keller	1
	8260						
00774	PAH's in Water by HPLC	SW-846 8310	1	10130WAB026	05/14/2010 22:)1 Mark A Clark	1



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Sample Description: S-268 Grab Water Sample

Sunoco Philadelphia - 26th St

LLI Sample # WW 5975069 LLI Group # 1193762 Account # 11183

Project Name: Sunoco Philadelphia - 26th St

Collected: 05/06/2010 15:40 by TC Sunoco c/o Stantec 1060 Andrew Drive

Submitted: 05/07/2010 19:30 Suite 140

Reported: 05/19/2010 10:24 West Chester PA 19380

Discard: 07/19/2010

S-268

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
03337	PAH Water Extraction	SW-846 3510C	1	10130WAB026	05/10/2010	16:50	JoElla L Rice	1
07879	EDB in Wastewater	SW-846 8011	1	101320002A	05/13/2010	13:41	Tyler O Griffin	1
07786	EDB Extraction	SW-846 8011	1	101320002A	05/12/2010	18:00	Kelli M Barto	1
06035	Lead	SW-846 6020	1	101336050002A	05/17/2010	15:55	Choon Y Tian	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	101336050002	05/13/2010	20:30	Mirit S Shenouda	1



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Quality Control Summary

Client Name: Sunoco c/o Stantec Group Number: 1193762

Reported: 05/19/10 at 10:24 AM

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the

Laboratory Compliance Quality Control

Analysis Name	Blank <u>Result</u>	Blank <u>MDL</u>	Report <u>Units</u>	LCS %REC	LCSD %REC	LCS/LCSD <u>Limits</u>	RPD	RPD Max
Batch number: F101314AA	Sample nu	mber(s): 59	75069					
Benzene	N.D.	0.5	uq/1	84	84	79-120	0	30
1,2-Dichloroethane	N.D.	0.5	ug/1	82	84	70-130	2	30
Ethylbenzene	N.D.	0.5	ug/1	89	89	79-120	0	30
Isopropylbenzene	N.D.	0.5	ug/1	90	93	77-120	4	30
Methyl Tertiary Butyl Ether	N.D.	0.5	ug/1	76	79	76-120	4	30
Naphthalene	N.D.	1.	ug/1	78	78	62-120	0	30
Toluene	N.D.	0.5	ug/1	93	93	79-120	0	30
1,2,4-Trimethylbenzene	N.D.	0.5	ug/1	90	87	74-120	3	30
1,3,5-Trimethylbenzene	N.D.	0.5	ug/1	87	85	75-120	2	30
Xylene (Total)	N.D.	0.5	ug/1	93	95	80-120	2	30
•			Σ.					
Batch number: P101321AA		mber(s): 59						
Benzene	N.D.	0.5	ug/l	103	100	79-120	3	30
1,2-Dichloroethane	N.D.	0.5	ug/l	101	101	70-130	0	30
Ethylbenzene	N.D.	0.5	ug/l	97	93	79-120	5	30
Isopropylbenzene	N.D.	0.5	ug/l	97	93	77-120	4	30
Methyl Tertiary Butyl Ether	N.D.	0.5	ug/l	104	106	76-120	1	30
Naphthalene	N.D.	1.	ug/l	88	90	62-120	3	30
Toluene	N.D.	0.5	ug/l	100	96	79-120	4	30
1,2,4-Trimethylbenzene	N.D.	0.5	ug/l	96	94	74-120	2	30
1,3,5-Trimethylbenzene	N.D.	0.5	ug/l	96	93	75-120	3	30
Xylene (Total)	N.D.	0.5	ug/l	97	93	80-120	5	30
Batch number: P101331AA	Sample nu	mber(s): 59	75060,5975	067-5975	068			
Benzene	N.D.	0.5	ug/l	99	100	79-120	1	30
1,2-Dichloroethane	N.D.	0.5	ug/l	95	96	70-130	1	30
Ethylbenzene	N.D.	0.5	ug/l	96	97	79-120	1	30
Isopropylbenzene	N.D.	0.5	ug/l	96	97	77-120	2	30
Methyl Tertiary Butyl Ether	N.D.	0.5	ug/l	100	97	76-120	3	30
Naphthalene	N.D.	1.	ug/l	84	88	62-120	4	30
Toluene	N.D.	0.5	ug/l	100	99	79-120	1	30
1,2,4-Trimethylbenzene	N.D.	0.5	ug/l	97	96	74-120	0	30
1,3,5-Trimethylbenzene	N.D.	0.5	ug/l	97	97	75-120	0	30
Xylene (Total)	N.D.	0.5	ug/l	95	96	80-120	1	30
Batch number: 10130WAB026	Sample nu	mber(s): 59	75055-5975	069				
Anthracene	N.D.	0.020	uq/l	77	77	69-103	0	30
Benzo(a)anthracene	N.D.	0.010	ug/l	81	80	74-109	0	30
Benzo(a)pyrene	N.D.	0.010	uq/l	87	87	67-107	0	30
Benzo(b) fluoranthene	N.D.	0.0080	ug/l	84	83	76-110	1	30
Benzo(g,h,i)perylene	N.D.	0.060	ug/l	91	91	62-117	0	30
Chrysene	N.D.	0.060	ug/l	89	90	74-111	0	30
Fluorene	N.D.	0.10	ug/l	87	87	67-107	Ō	30
Phenanthrene	N.D.	0.040	ug/l	90	90	71-108	0	30
Pyrene	N.D.	0.10	ug/l	91	90	70-108	0	30

^{*-} Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



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Quality Control Summary

Client Name: Sunoco c/o Stantec Group Number: 1193762

Reported: 05/19/10 at 10:24 AM

Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 101310002A		mber(s): 59						
Ethylene dibromide	N.D.	0.018	ug/l	88	88	60-140	0	20
Batch number: 101320002A	Sample nu	mber(s): 59	75064-5975	069				
Ethylene dibromide	N.D.	0.018	ug/l	92	88	60-140	5	20
Batch number: 101336050002A	Sample nu	mber(s): 59	75055-5975	069				
Lead	N.D.	0.00005		109		90-115		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike Background (BKG) = the sample used in conjunction with the duplicate

, , , , , , , , , , , , , , , , , , ,		5							
	MS	MSD	MS/MSD		RPD	BKG	DUP	DUP	Dup RPD
Analysis Name	<u>%REC</u>	%REC	<u>Limits</u>	RPD	<u>MAX</u>	Conc	Conc	<u>RPD</u>	<u>Max</u>
Batch number: F101314AA	Sample	number(s)	: 5975069	UNSPK:	P9755	92			
Benzene	89		80-126						
1,2-Dichloroethane	85		66-141						
Ethylbenzene	95		71-134						
Isopropylbenzene	99		75-128						
Methyl Tertiary Butyl Ether	81		72-126						
Naphthalene	95		52-125						
Toluene	98		80-125						
1,2,4-Trimethylbenzene	92		72-130						
1,3,5-Trimethylbenzene	90		72-131						
Xylene (Total)	101		79-125						
Batch number: P101321AA	Sample	number(s)	: 5975055	-597505	59,5975	061-597506	6 UNSPK: P	974433	
Benzene	108		80-126						
1,2-Dichloroethane	104		66-141						
Ethylbenzene	101		71-134						
Isopropylbenzene	100		75-128						
Methyl Tertiary Butyl Ether	107		72-126						
Naphthalene	89		52-125						
Toluene	104		80-125						
1,2,4-Trimethylbenzene	96		72-130						
1,3,5-Trimethylbenzene	97		72-131						
Xylene (Total)	99		79-125						
Batch number: P101331AA	Sample	number(s)	: 5975060	,597506	7-5975	068 UNSPK:	P978333		
Benzene	105		80-126	•					
1,2-Dichloroethane	99		66-141						
Ethylbenzene	101		71-134						
Isopropylbenzene	100		75-128						
Methyl Tertiary Butyl Ether	105		72-126						
Naphthalene	101		52-125						
Toluene	106		80-125						
1,2,4-Trimethylbenzene	96		72-130						
1,3,5-Trimethylbenzene	96		72-131						
Xylene (Total)	99		79-125						
2									

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



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Quality Control Summary

Client Name: Sunoco c/o Stantec Group Number: 1193762

Reported: 05/19/10 at 10:24 AM

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD <u>MAX</u>	BKG Conc	DUP <u>Conc</u>	DUP RPD	Dup RPD Max
Batch number: 101310002A Ethylene dibromide	Sample 83	number(s)	: 5975055 65-135	-597506	3 UNSPA	X: 5975055 N.D.	BKG: 5975056 N.D.	0 (1)	30
Batch number: 101320002A Ethylene dibromide	Sample 83	number(s)	: 5975064 65-135	-597506	9 UNSPR	K: 5975065 N.D.	BKG: 5975066 N.D.	0 (1)	30
Batch number: 101336050002A Lead	Sample	number(s) 102		-597506 2	9 UNSPR 20		BKG: 5975056 0.00031 J	35* (1)	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: UST BTEX, MTBE in Water

Batch number: F101314AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
5975069	105	100	101	101
Blank	104	100	100	92
LCS	103	100	100	95
LCSD	104	99	100	100
MS	104	101	99	98
Limits:	80-116	77-113	80-113	78-113

Analysis Name: UST BTEX, MTBE in Water

Batch number: P101321AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8 100 97 99 100 99 100 99 101 99 101 99 99 100 100	loroethane-d4 Toluene-d8 4-Bromo:	
5975055	101	101	100	99	
5975056	101	103	97	101	
5975057	101	100	99	100	
5975058	100	101	100	101	
5975059	102	103	99	98	
5975061	101	101	100	99	
5975062	101	102	99	100	
5975063	101	100	99	101	
5975064	100	102	101	99	
5975065	103	101	99	99	
5975066	103	102	99	99	
Blank	100	102	100	98	
LCS	101	103	100	100	
LCSD	101	104	99	98	
MS	101	104	99	99	
Limits:	80-116	77-113	80-113	78-113	

Analysis Name: UST BTEX, MTBE in Water

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



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Page 4 of 5

Quality Control Summary

Group Number: 1193762 Client Name: Sunoco c/o Stantec

Reported: 05/19/10 at 10:24 AM

Surrogate Quality Control

Datah numl	per: P101331AA		-	
Daten nam	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
5975060	98	100	102	105
5975067	98	102	101	97
5975068	99	102	101	99
Blank	99	101	101	97
LCS	98	103	102	98
LCSD	98	105	102	98
MS	98	100	101	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: PAH's in Water by HPLC Batch number: 10130WAB026

	Nitrobenzene	Triphenylene	
5975055	100	93	
5975056	91	93	
5975057	97	97	
5975058	101	99	
5975059	96	98	
5975060	125*	112	
5975061	107	129*	
5975062	107	104	
5975063	107	113	
5975064	98	96	
5975065	95	91	
5975066	97	99	
5975067	99	99	
5975068	101	93	
5975069	93	94	
Blank	97	100	
LCS	90	96	
LCSD	91	98	

77-122

67-111

Analysis Name: EDB in Wastewater Batch number: 101310002A 1,1,2,2-

Tetrachloroethane

5975055	97
5975056	74
5975057	90
5975058	96
5975059	85
5975060	87
5975061	90
5975062	106
5975063	91
Blank	93
DUP	73
LCS	86
LCSD	86
MS	89

Limits:

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



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Page 5 of 5

Quality Control Summary

Client Name: Sunoco c/o Stantec Group Number: 1193762

Reported: 05/19/10 at 10:24 AM

Surrogate Quality Control

Limits: 46-136

Analysis Name: EDB in Wastewater

Batch number: 101320002A

1,1,2,2-

Tetrachloroethane

5975064	108
5975065	106
5975066	96
5975067	91
5975068	88
5975069	90
Blank	92
DUP	75
LCS	94
LCSD	91
MS	87

Limits: 46-136

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Analysis Request/ Environmental Services Chain of Custody

412	Lancaster Laboratories
7][Laboratories

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For Lancaster Laboratories use only

Analysis Request/ Environmental Services Chain of Custody

Lancaster	For Lancaster Laboratories use only Acct. # 1183 Group# 1193762 Sample # 5975055-69 COC #	‡ 235049
Laboratories	Please print. Instructions on reverse side correspond with circled numbers. 6.8-1.60	2 of 2

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Lancaster Laboratories Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

N.D.	none detected	BMQL	Below Minimum Quantitation Level
TNTC	Too Numerous To Count	MPN	Most Probable Number
IU	International Units	CP Units	cobalt-chloroplatinate units
umhos/cm	micromhos/cm	NTU	nephelometric turbidity units
С	degrees Celsius	F	degrees Fahrenheit
Cal	(diet) calories	lb.	pound(s)
meq	milliequivalents	kg	kilogram(s)
g	gram(s)	mg	milligram(s)
ug	microgram(s)	Ī	liter(s)
ml	milliliter(s)	ul	microliter(s)
m3	cubic meter(s)	fib >5 um/ml	fibers greater than 5 microns in length per ml

- < less than The number following the sign is the <u>limit of quantitation</u>, the smallest amount of analyte which can be reliably determined using this specific test.
- > greater than
- ppm parts per million One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.

Inorganic Qualifiers

- ppb parts per billion
- **Dry weight**Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture.

U.S. EPA data qualifiers:

Organic Qualifiers

A B C D E	TIC is a possible aldol-condensation product Analyte was also detected in the blank Pesticide result confirmed by GC/MS Compound quatitated on a diluted sample Concentration exceeds the calibration range of the instrument	B E M N S	Value is <crdl, (msa)="" additions="" amount="" but="" calculation<="" control="" due="" duplicate="" estimated="" for="" injection="" interference="" limits="" met="" method="" not="" of="" precision="" spike="" standard="" th="" to="" used="" within="" ≥idl=""></crdl,>
J N P	Estimated value Presumptive evidence of a compound (TICs only) Concentration difference between primary and confirmation columns >25% Compound was not detected	U W * +	Compound was not detected Post digestion spike out of control limits Duplicate analysis not within control limits Correlation coefficient for MSA <0.995
X,Y,Z	Defined in case narrative		

Analytical test results for methods listed on the laboratories' accreditation scope meet all requirements of NELAC unless otherwise noted under the individual analysis.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

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